We claim:

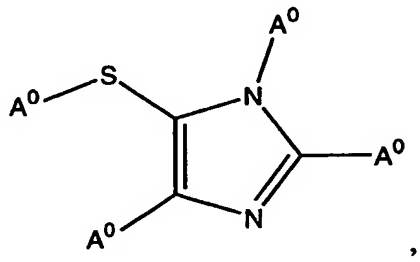
In the following claims the subscript and superscripts of a given variable are distinct. For example, $R_1$ is distinct from $R^1$.

1. A non-nucleoside reverse transcriptase inhibitor compound comprising a phosphonate group.

2. A non-nucleoside reverse transcriptase inhibitor of claim 1 selected from:
Capravirine-like phosphonate NNRTI compounds,
PETT-like phosphonate NNRTI compounds,
Pyrazole-like phosphonate NNRTI compounds,
Urea-PETT-like phosphonate NNRTI compounds,
Nevaripine-like phosphonate NNRTI compounds,
Quinazolinone-like phosphonate NNRTI compounds,
Efavirenz-like phosphonate NNRTI compounds,
Benzophenone-like phosphonate NNRTI compounds,
Pyrimidine-like phosphonate NNRTI compounds,
SJ3366-like phosphonate NNRTI compounds,
Delavirdine-like phosphonate NNRTI compounds,
Emivirine-like phosphonate NNRTI compounds,
Loviride-like phosphonate NNRTI compounds, and
UC781-like phosphonate NNRTI compounds;

and pharmaceutically acceptable salts, hydrates, and formulations thereof.

3. A compound according to claim 1 selected from the Formulas:



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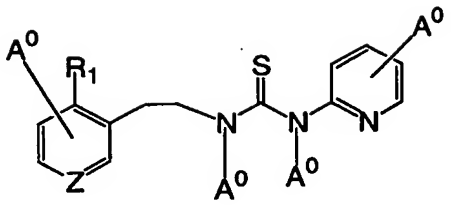
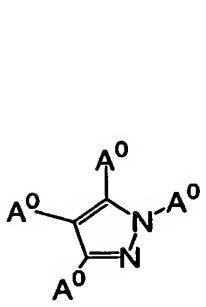


where Z is CH or N,



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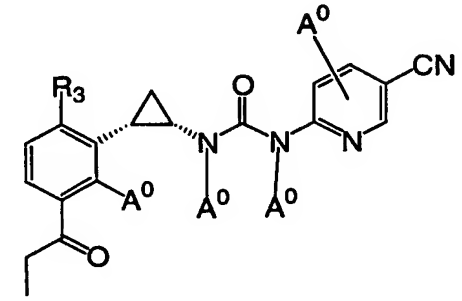

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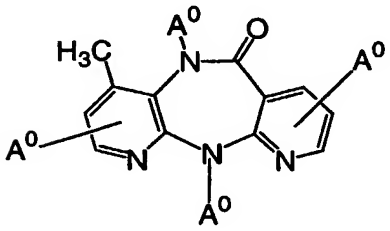

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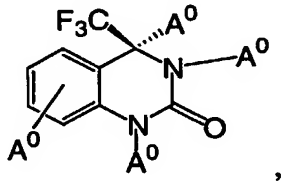

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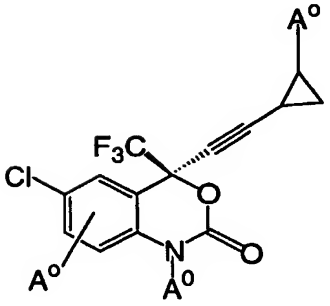

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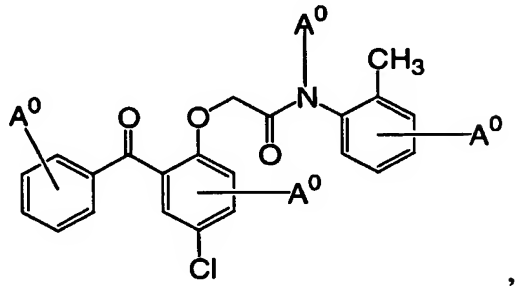

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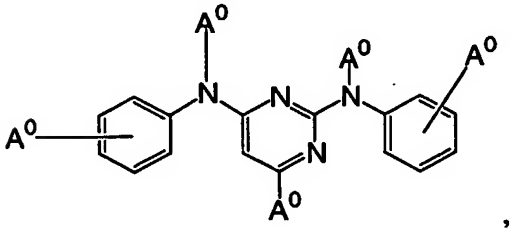

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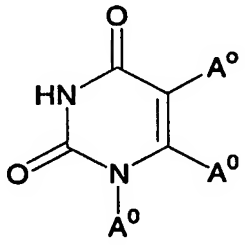

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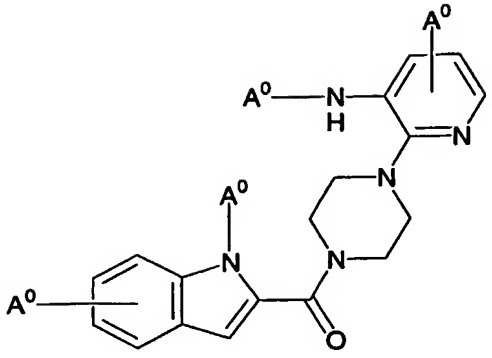
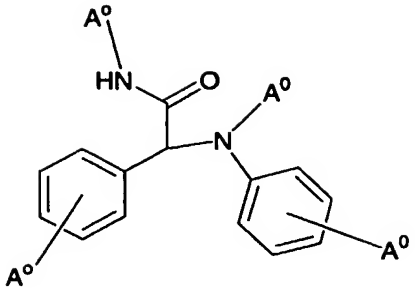
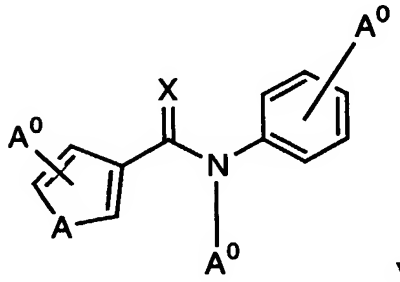
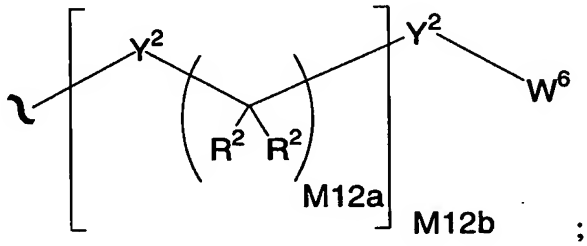


, and



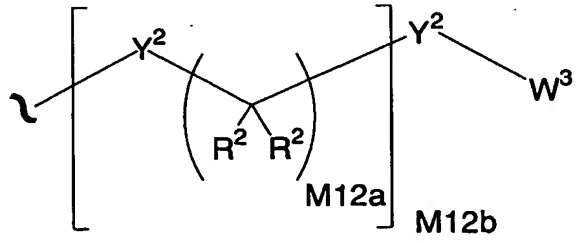
where A is O, S, or N($R^x$) and X is O or S;

wherein $A^0$ is $A^1$, $A^2$ or $W^3$ with the proviso that the compound includes at least one $A^1$;

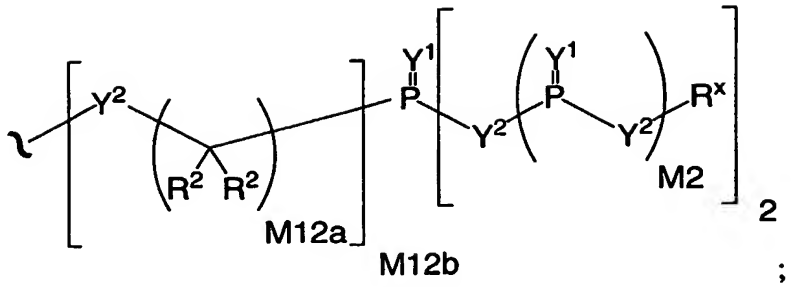
$A^1$ is:


;

$A^2$ is:


;

$A^3$ is:

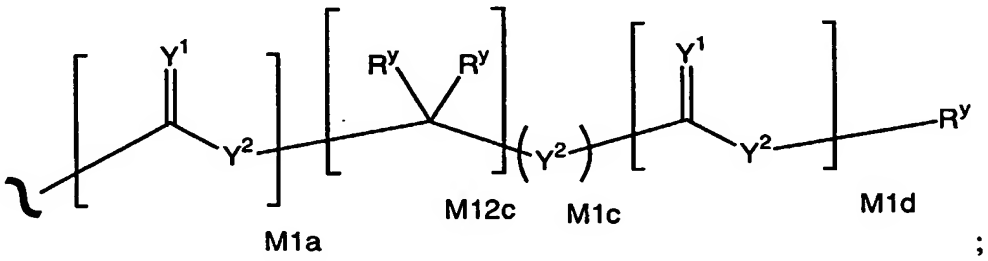



;

$Y^1$ is independently O, S, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, or $N(N(R^x)(R^x))$;

$Y^2$ is independently a bond, O, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, $N(N(R^x)(R^x))$, $-S(O)_{M2}-$, or $-S(O)_{M2}-S(O)_{M2}-$;

$R^x$ is independently H, $R^1$, $W^3$, a protecting group, or the formula:




;

$R^y$ is independently H, $W^3$, $R^2$ or a protecting group;

$R^1$ is independently H or alkyl of 1 to 18 carbon atoms;

$R^2$ is independently H, $R^1$, $R^3$ or $R^4$ wherein each $R^4$ is independently substituted with 0 to 3 $R^3$ groups, or taken together at a carbon atom, two $R^2$ groups form a ring of 3 to 8 carbons and the ring may be substituted with 0 to 3 $R^3$ groups;

$R^3$ is $R^{3a}$, $R^{3b}$, $R^{3c}$ or $R^{3d}$, provided that when $R^3$ is bound to a heteroatom, then $R^3$ is $R^{3c}$ or $R^{3d}$;

$R^{3a}$ is F, Cl, Br, I, -CN, $N_3$ or $-NO_2$;

$R^{3b}$ is $Y^1$;

$R^{3c}$ is $-R^x$, $-N(R^x)(R^x)$, $-SR^x$, $-S(O)R^x$, $-S(O)_2R^x$, $-S(O)(OR^x)$, $-S(O)_2(OR^x)$, $-OC(Y^1)R^x$, $-OC(Y^1)OR^x$, $-OC(Y^1)(N(R^x)(R^x))$, $-SC(Y^1)R^x$, $-SC(Y^1)OR^x$, $-SC(Y^1)(N(R^x)(R^x))$, $-N(R^x)C(Y^1)R^x$, $-N(R^x)C(Y^1)OR^x$, or $-N(R^x)C(Y^1)(N(R^x)(R^x))$ ;

$R^{3d}$ is $-C(Y^1)R^x$, $-C(Y^1)OR^x$ or $-C(Y^1)(N(R^x)(R^x))$;

$R^4$ is an alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, or alkynyl of 2 to 18 carbon atoms;

$R^5$ is $R^4$ wherein each $R^4$ is substituted with 0 to 3 $R^3$ groups;

$W^3$ is $W^4$ or $W^5$;

$W^4$ is $R^5$, $-C(Y^1)R^5$, $-C(Y^1)W^5$, $-SO_2R^5$, or $-SO_2W^5$;

$W^5$ is carbocycle or heterocycle wherein $W^5$ is independently substituted with 0 to 3 $R^2$ groups;

$W^6$ is $W^3$ are independently substituted with 1, 2, or 3 $A^3$ groups;

M2 is 0, 1 or 2;

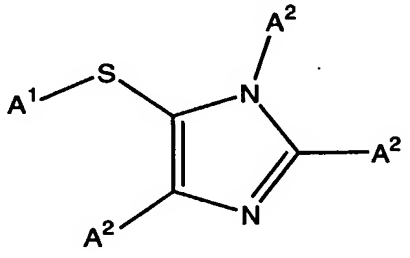
M12a is 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12;

M12b is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

M1a, M1c, and M1d are independently 0 or 1; and

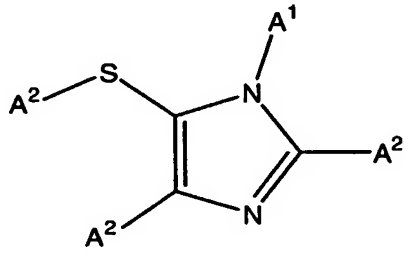
M12c is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

4. A compound of claim 3 having Formula Ia:



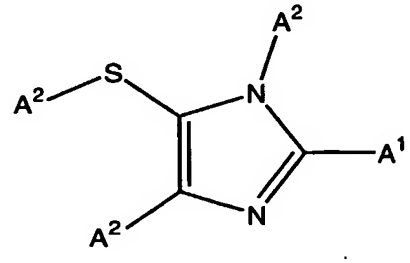
Ia.

5. A compound of claim 3 having Formula Ib:



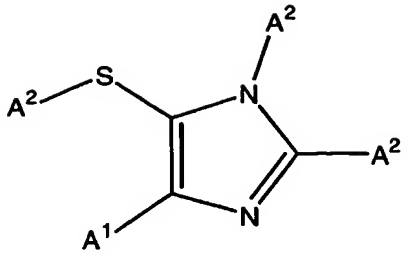
Ib.

6. A compound of claim 3 having Formula Ic:



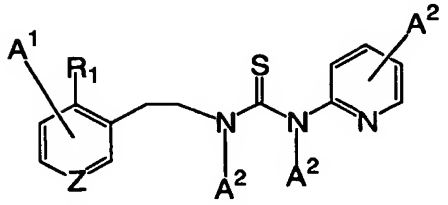
Ic.

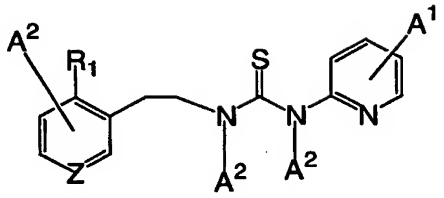
7. A compound of claim 3 having Formula Id:

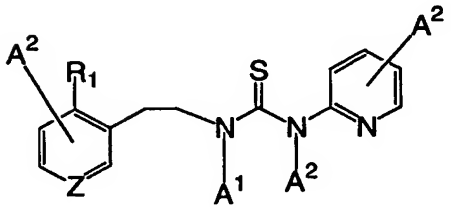


Id.

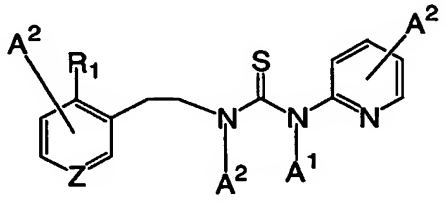
8. A compound of claim 3 having the formulas:







and



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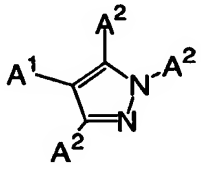
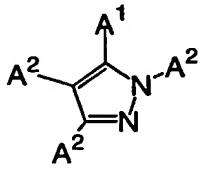
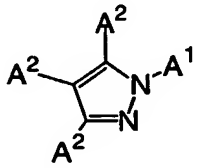
9. A compound of claim 3 having the formulas:







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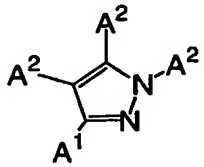
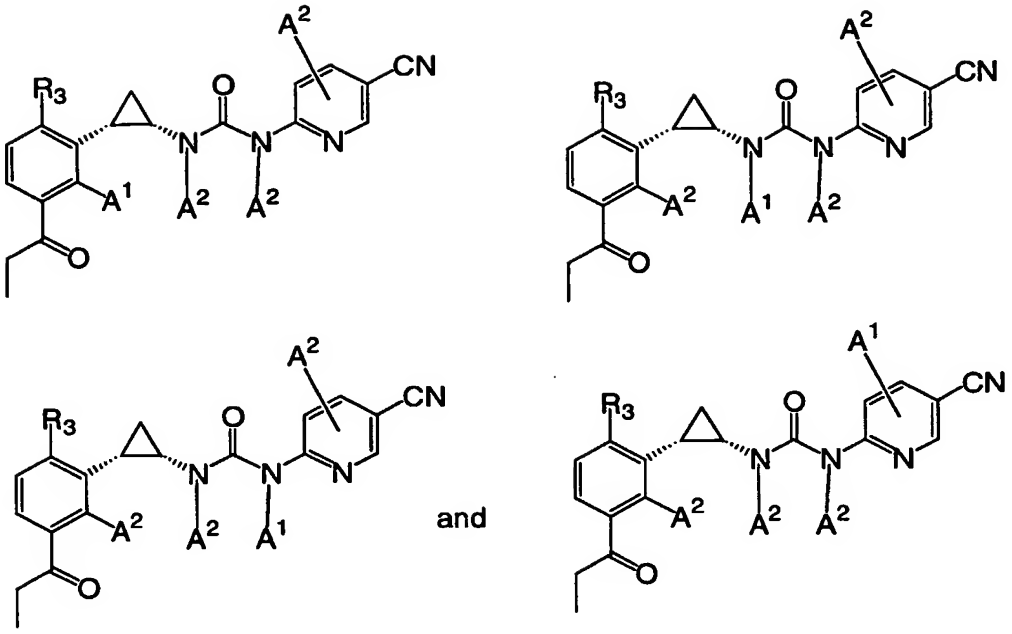
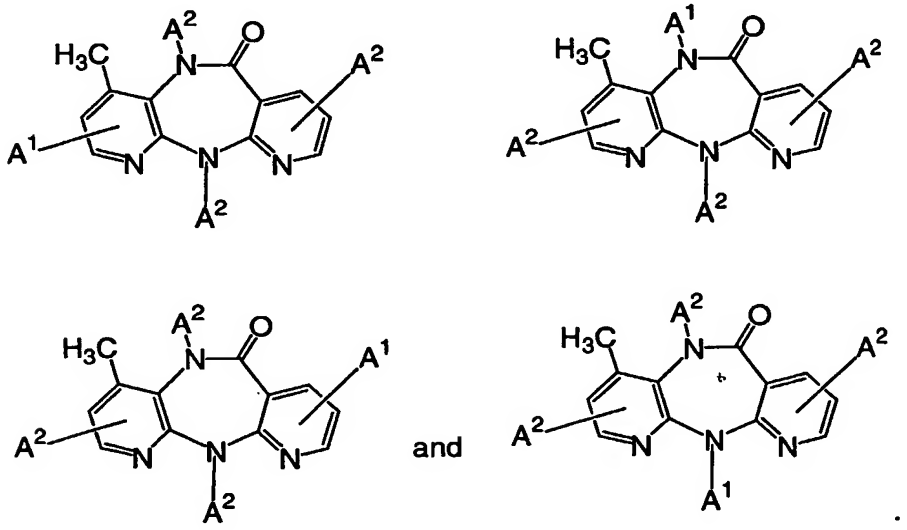


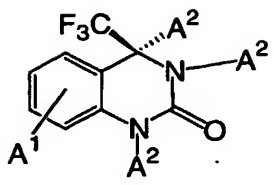
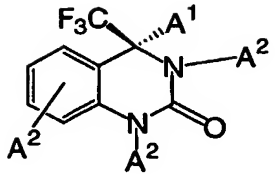
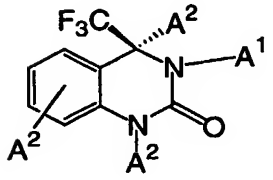
10. A compound of claim 3 having the formulas:




11. A compound of claim 3 having the formulas:




12. A compound of claim 3 having the formulas: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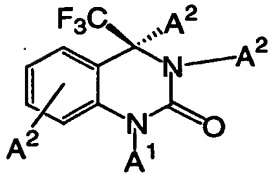
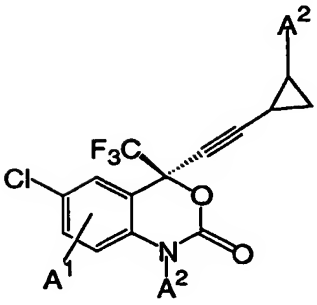
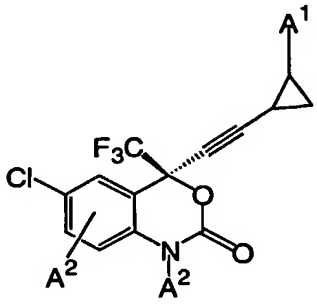


13. A compound of claim 3 having the formulas: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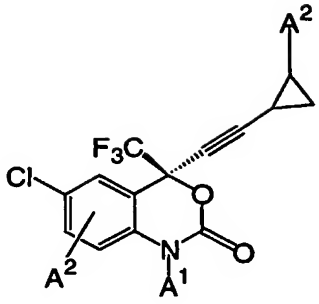

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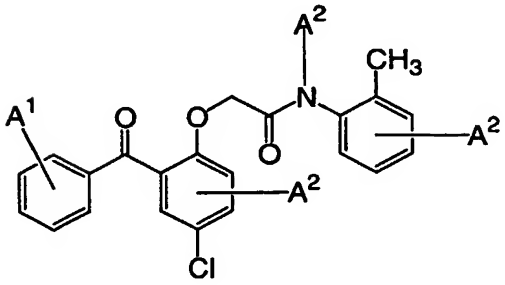
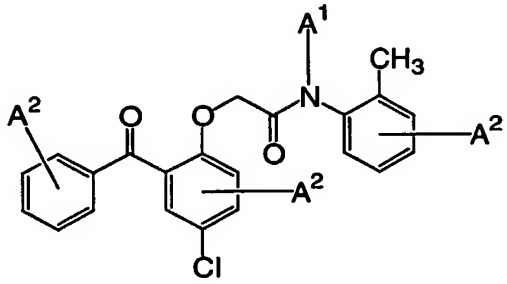
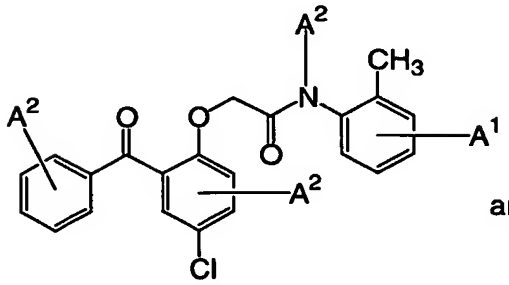
14. A compound of claim 3 having the formulas: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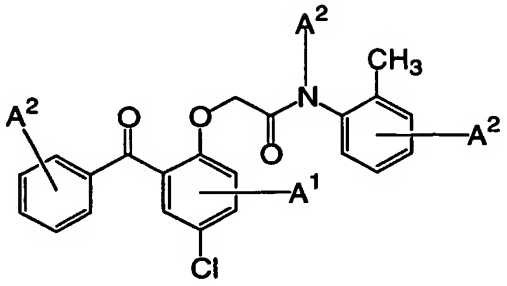
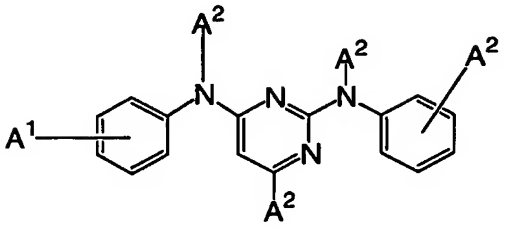
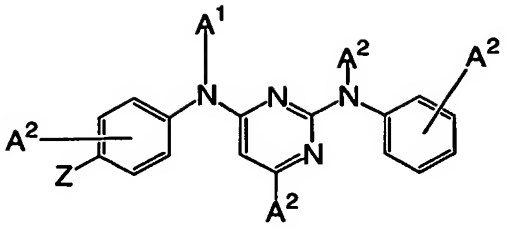
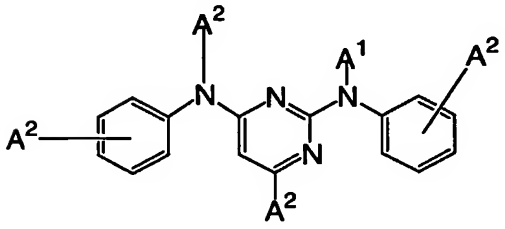
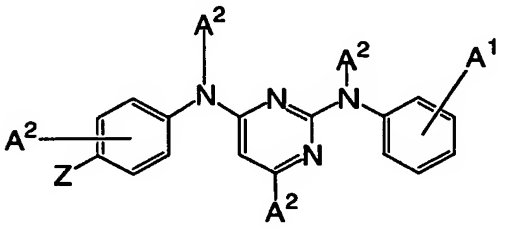


15. A compound of claim 3 having the formulas:









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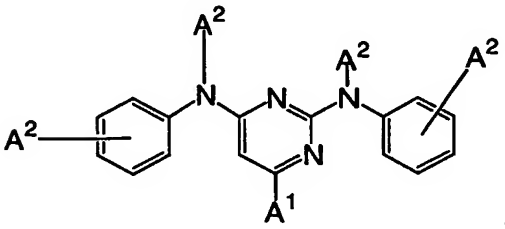
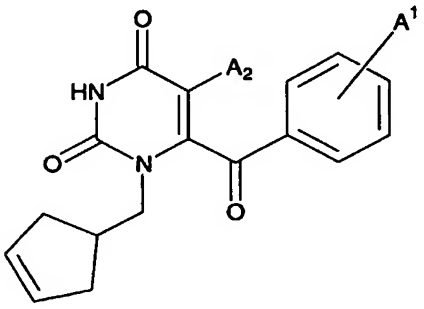
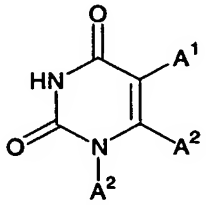
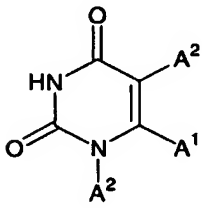


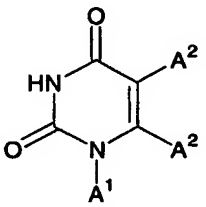
16. A compound of claim 3 having the formulas:



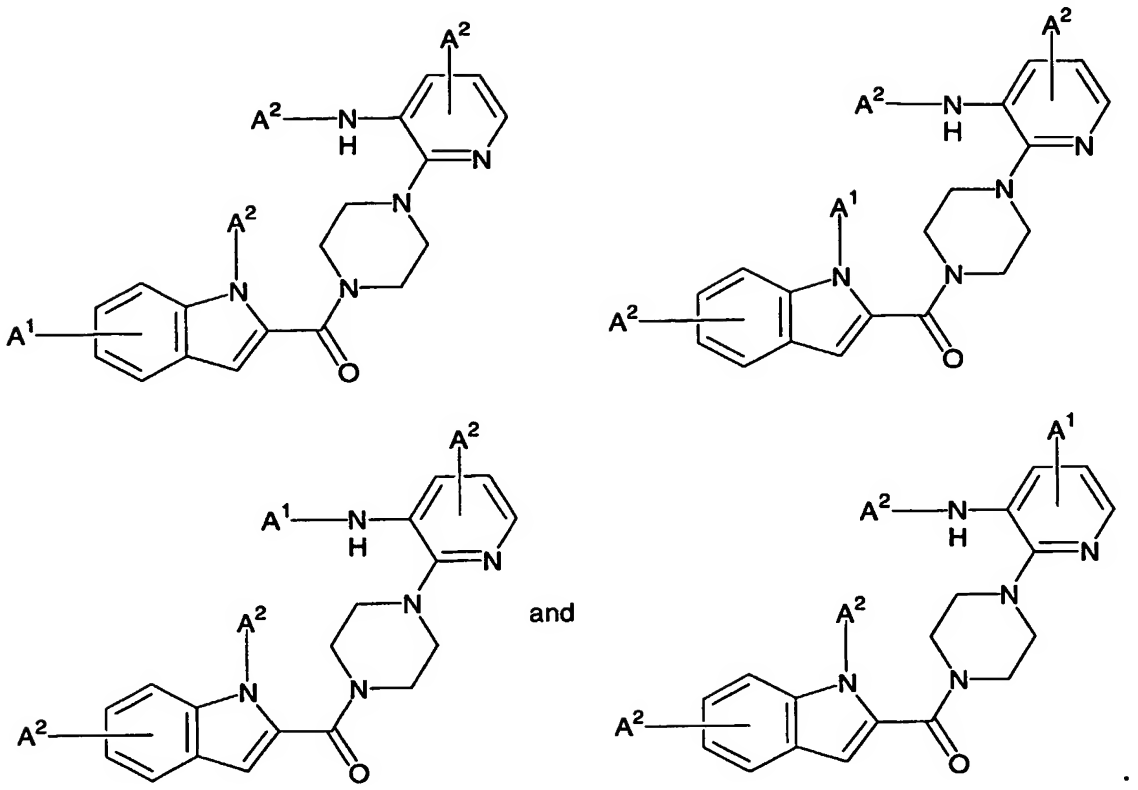




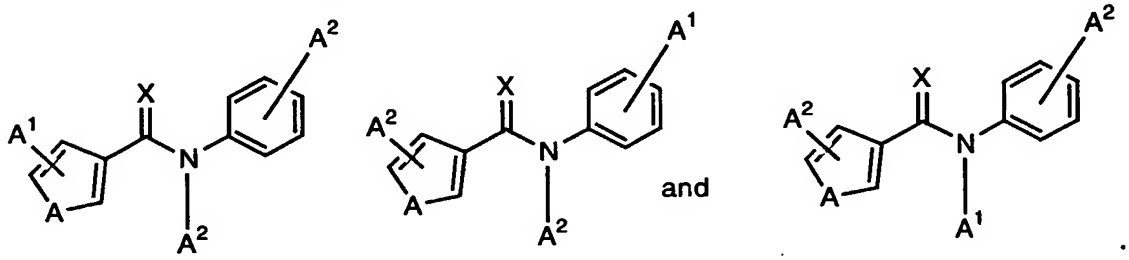
and



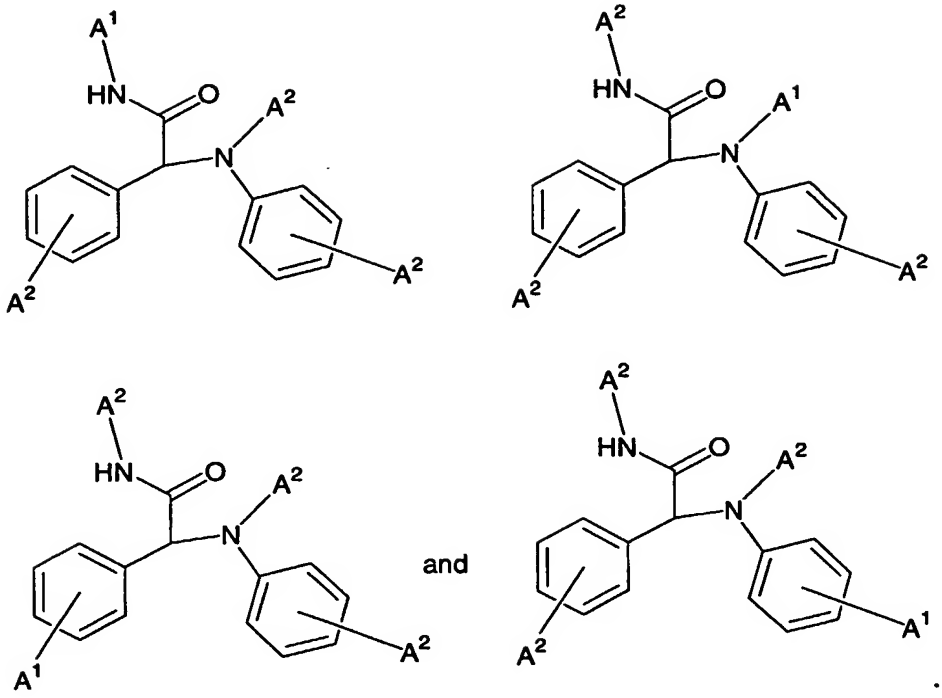
17. A compound of claim 3 having the formulas:



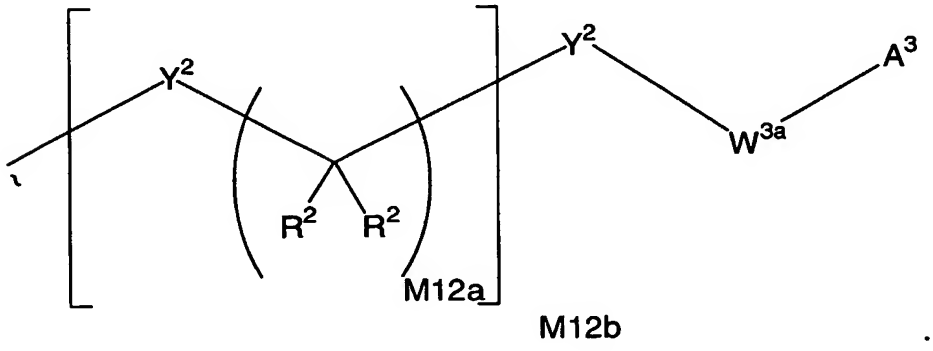
18. A compound of claim 3 having the formulas:



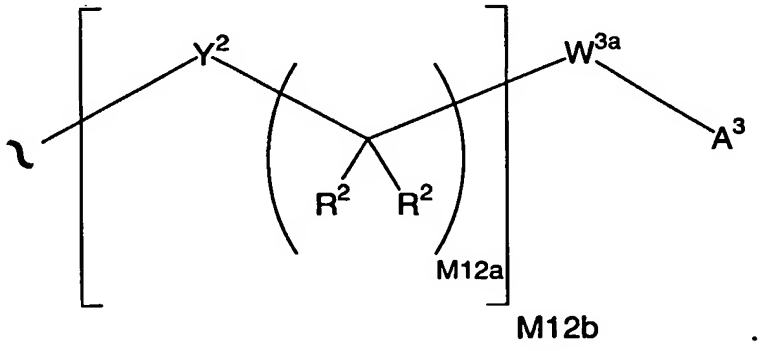
19. A compound of claim 3 having the formulas:



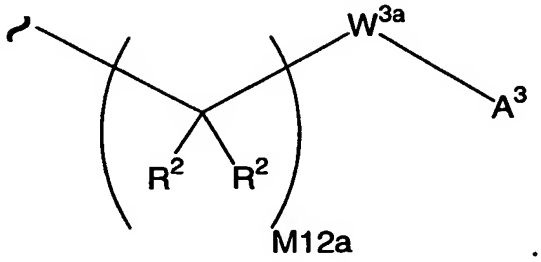

20. The compound of claim 3 wherein $A^1$ is of the formula:



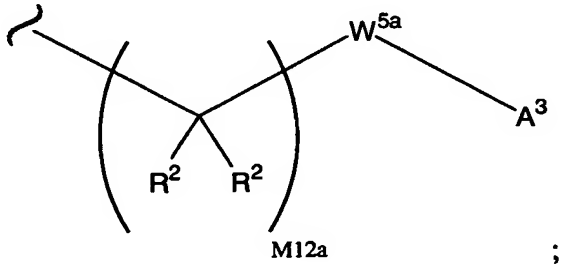

21. The compound of claim 20 wherein $A^1$ is of the formula:



22. The compound of claim 21 wherein $A^1$ is of the formula:




23. The compound of claim 22 wherein $A^1$ is of the formula:

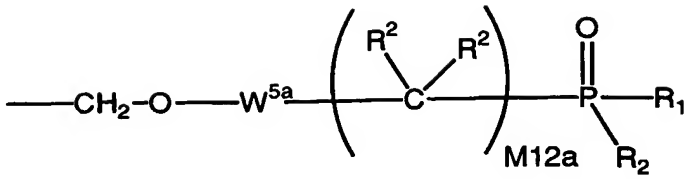



;

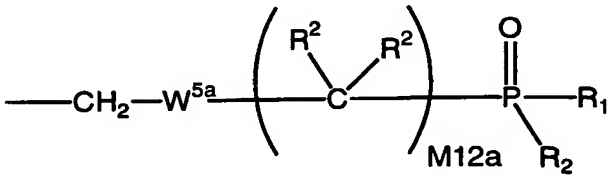
and $W^{5a}$ is a carbocycle or a heterocycle where $W^{5a}$ is independently substituted with 0 or 1 $R^2$ groups.

24. The compound of claim 23 wherein M12a is 1.

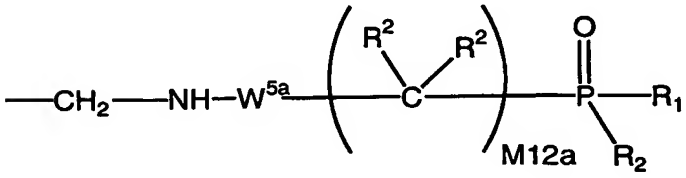
25. The compound of claim 23 wherein $A^1$ is selected from the formulas:



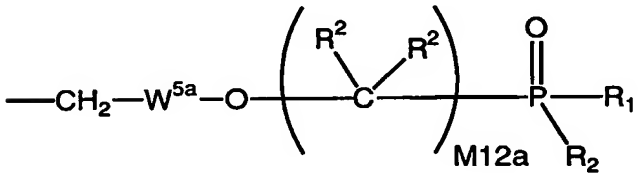

,



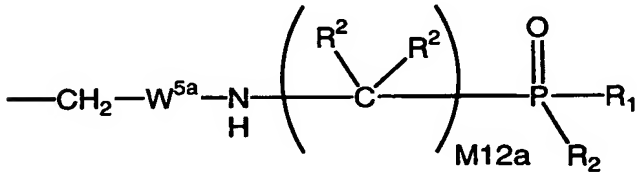

,




,

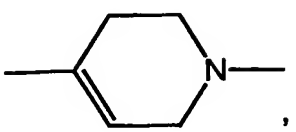
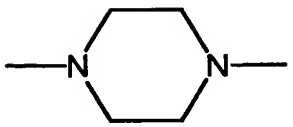
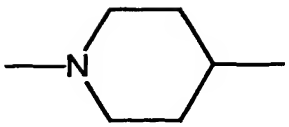
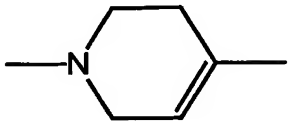



, and




$R_1$ and $R_2$ are independently selected from hydroxy, methoxy, ethoxy, trifluoroethoxy, isopropoxy, phenoxy, benzyloxy, O-pivaloyloxymethyl, an amino acid ester and a lactate ester; and

$W^{5a}$ is selected from the formulas:


,

,

,

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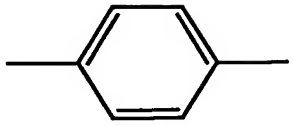
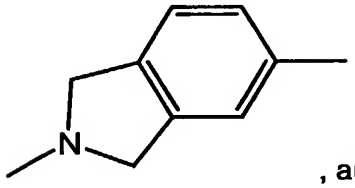
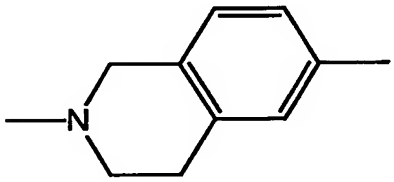
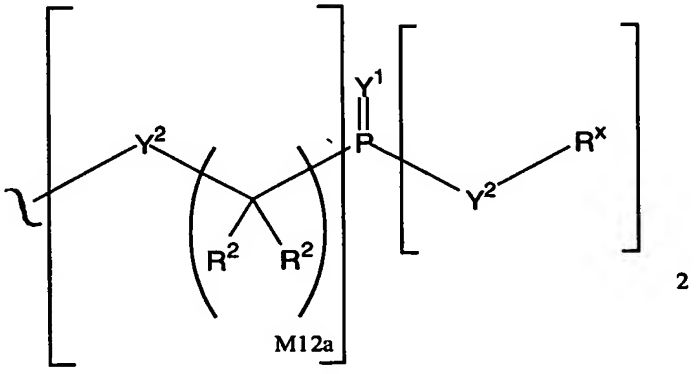

,

, and


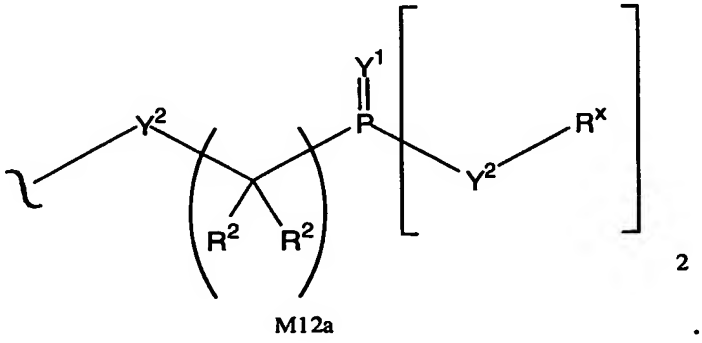
26. The compound of claim 3 wherein $A^3$ is of the formula:



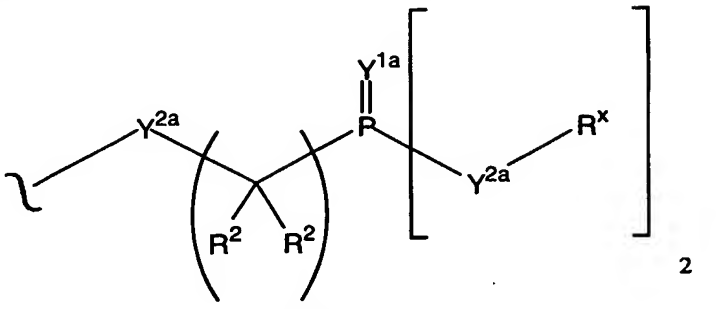

M12b

5

27. The compound of claim 26 wherein $A^3$ is of the formula:



28. The compound of claim 27 wherein $A^3$ is of the formula:

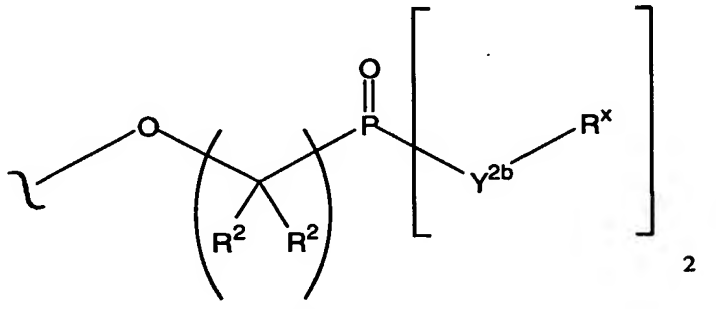


M12a ;

$Y^{1a}$ is O or S; and

$Y^{2a}$ is O, N($R^x$) or S.

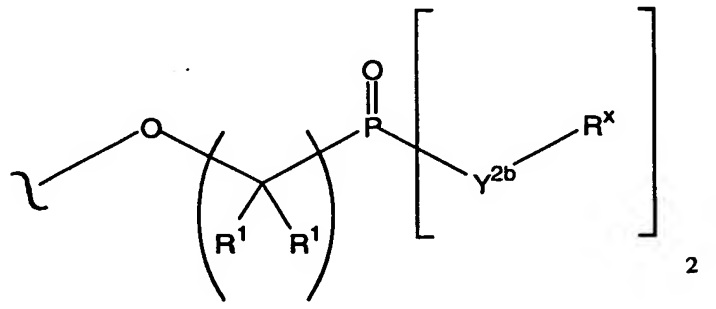
29. The compound of claim 28 wherein $A^3$ is of the formula:



M12a ;

and $Y^{2b}$ is O or N($R^x$).

30. The compound of claim 29 wherein $A^3$ is of the formula:

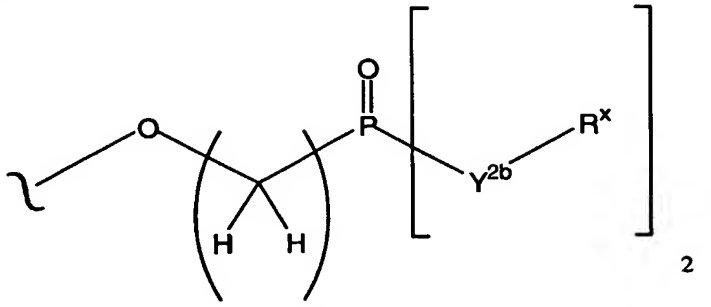


M12d ;

. $Y^{2b}$ is O or N($R^x$); and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

31. The compound of claim 30 wherein $A^3$ is of the formula:



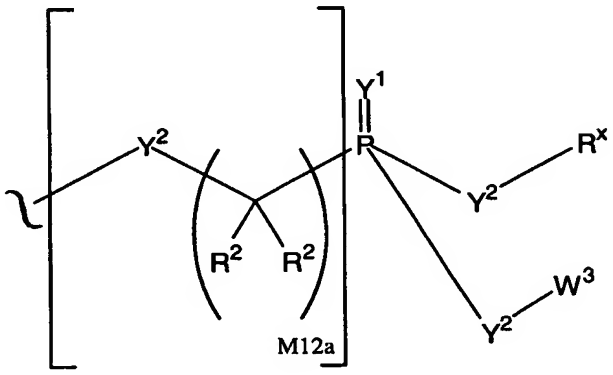
M12d ;

$Y^{2b}$ is O or N($R^x$); and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

32. The compound of claim 31 wherein M12d is 1.

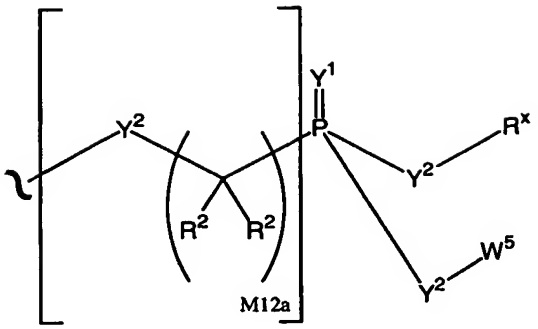
33. The compound of claim 3 wherein $A^3$ is of the formula:



M12a

M12b

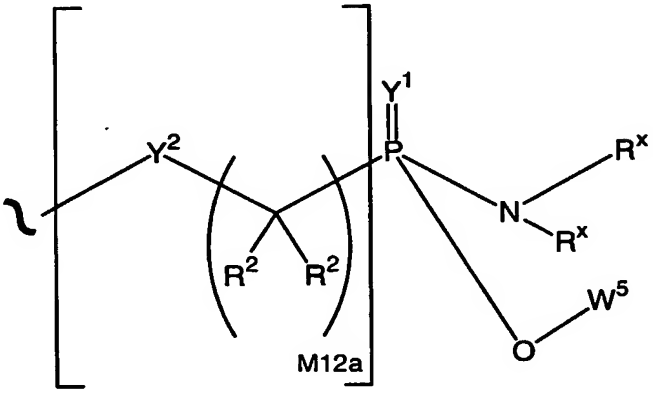
34. The compound of claim 33 wherein $A^3$ is of the formula:




M12b

35. The compound of claim 34 wherein $W^5$ is a carbocycle.

36. The compound of claim 35 wherein $A^3$ is of the formula:

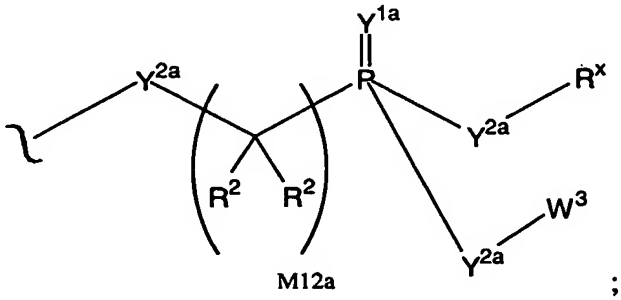



M12b

37. The compound of claim 36 wherein $W^5$ is phenyl.

38. The compound of claim 33 wherein M12b is 1.

39. The compound of claim 38 wherein $A^3$ is of the formula:

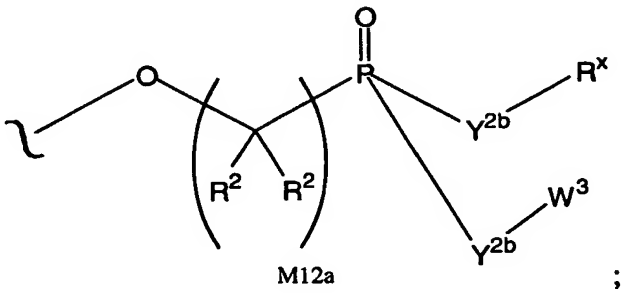



;

$Y^{1a}$ is O or S; and

$Y^{2a}$ is O, N($R^x$) or S.

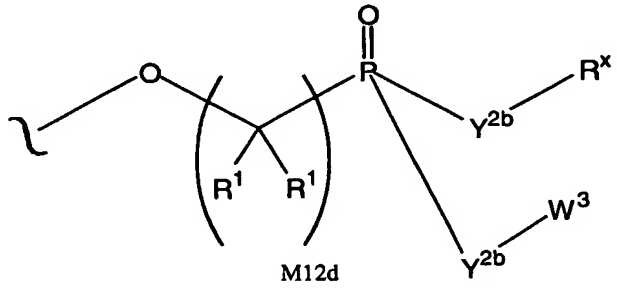
40. The compound of claim 39 wherein $A^3$ is of the formula:



M12a ;

and $Y^{2b}$ is O or N($R^x$).

41. The compound of claim 40 wherein $A^3$ is of the formula:



M12d ;

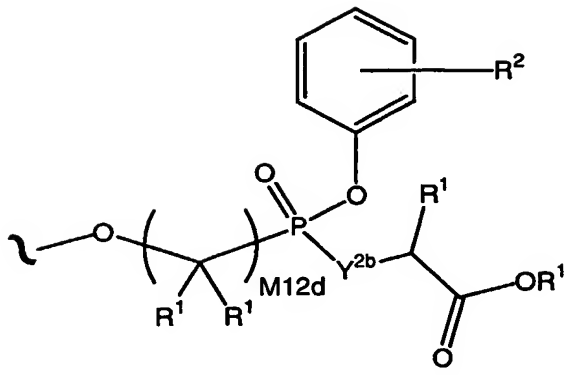
$Y^{2b}$ is O or N($R^x$); and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

42. The compound of claim 41 wherein $R^1$ is H.

43. The compound of claim 41 wherein M12d is 1.

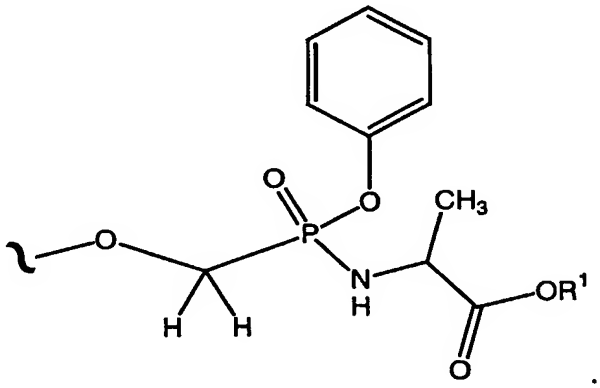
44. The compound of claim 41 wherein $A^3$ is of the formula:



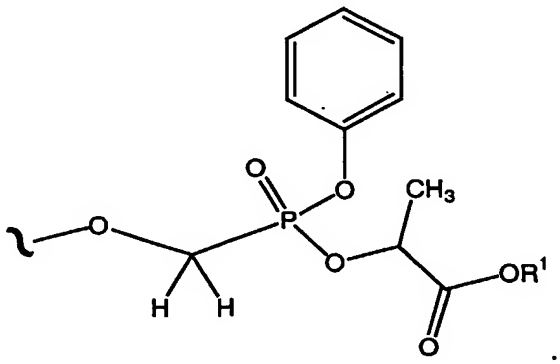

wherein the phenyl carbocycle is substituted with 0 to 3 $R^2$ groups, and $R^1$ is H or $C_1$–$C_{18}$ alkyl.

45. The compound of claim 44 wherein $Y^{2b}$ is $N(R^x)$.

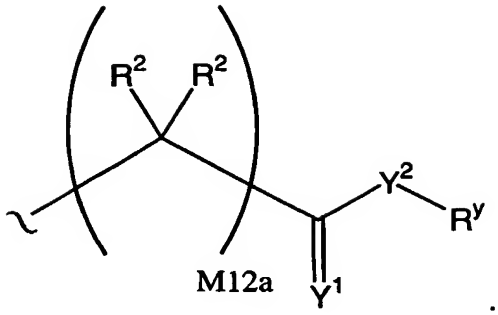
46. The compound of claim 45 wherein $A^3$ is of the formula:



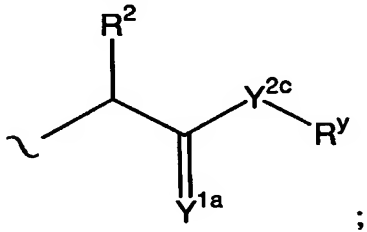

47. The compound of claim 44 wherein $A^3$ is of the formula:




48. A compound of claim 3 wherein $R^x$ is of the formula:




49. A compound of claim 48 wherein $R^x$ is of the formula:

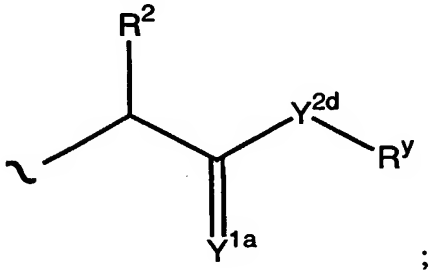



;

$Y^{1a}$ is O or S; and

$Y^{2c}$ is O, N($R^y$) or S.

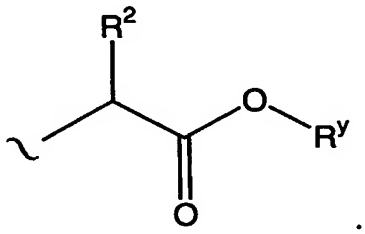
50. A compound of claim 48 wherein $R^x$ is of the formula:



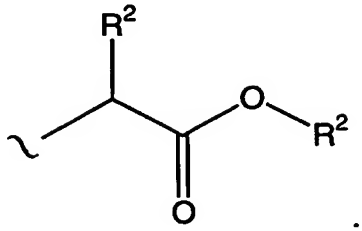

;

and $Y^{2d}$ is O or N($R^y$).

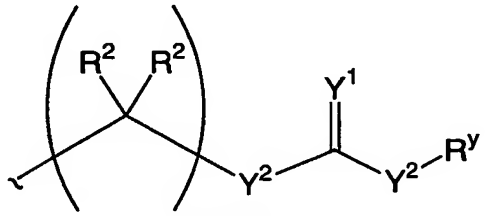
51. A compound of claim 50 wherein $R^x$ is of the formula:



52. A compound of claim 51 wherein $R^x$ is of the formula:

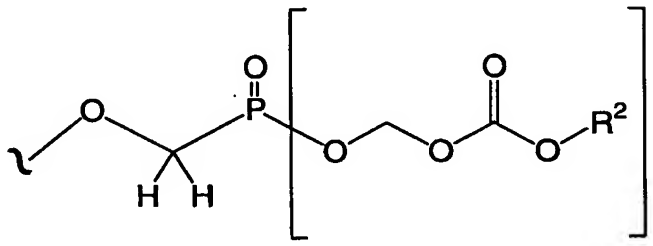


53. The compound of claim 3 wherein $R^x$ is of the formula:

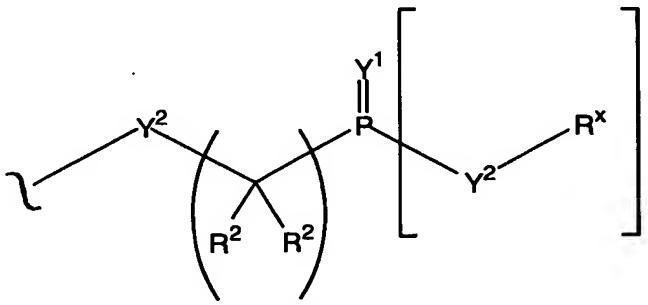


M12a

54. The compound of claim 53 wherein $A^3$ is of the formula:

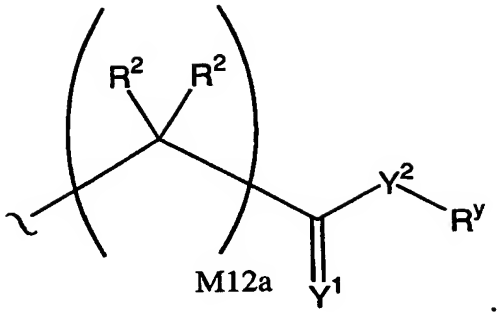


55. The compound of claim 3 wherein $A^3$ is of the formula:

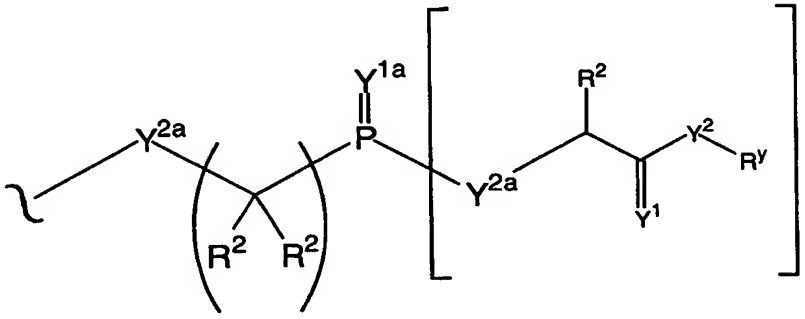


M12a ; and

$R^x$ is of the formula:




56. The compound of claim 55 wherein $A^3$ is of the formula:

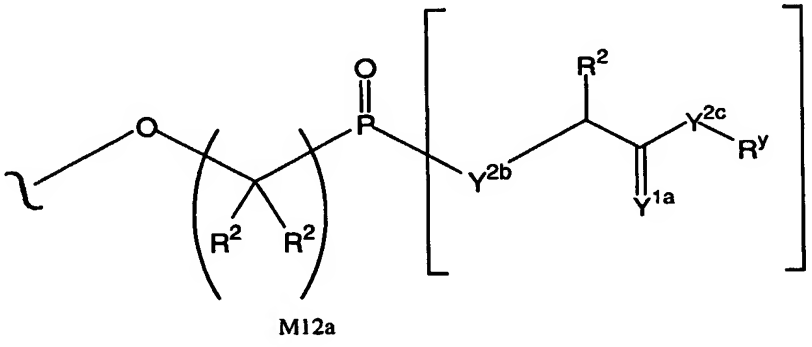



;

$Y^{1a}$ is O or S; and

$Y^{2a}$ is O, N($R^2$) or S.

57. The compound of claim 56 wherein $A^3$ is of the formula:

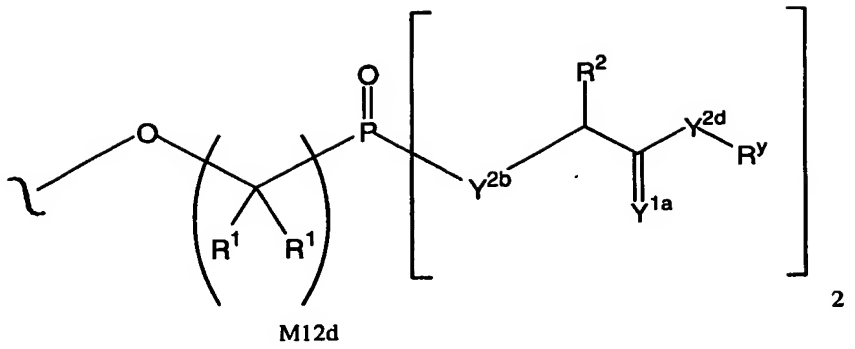



;

$Y^{2b}$ is O or N($R^2$); and

$Y^{2c}$ is O, N($R^y$) or S.

58. The compound of claim 57 wherein $A^3$ is of the formula:



M12d

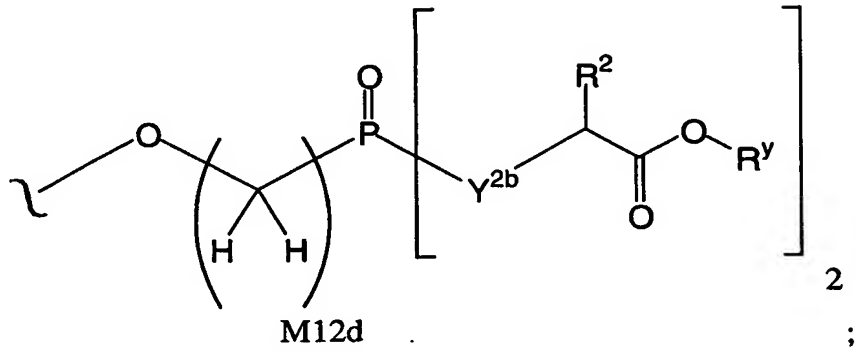
$Y^{1a}$ is O or S;

$Y^{2b}$ is O or $N(R^2)$;

$Y^{2d}$ is O or $N(R^y)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

59. The compound of claim 58 wherein $A^3$ is of the formula:

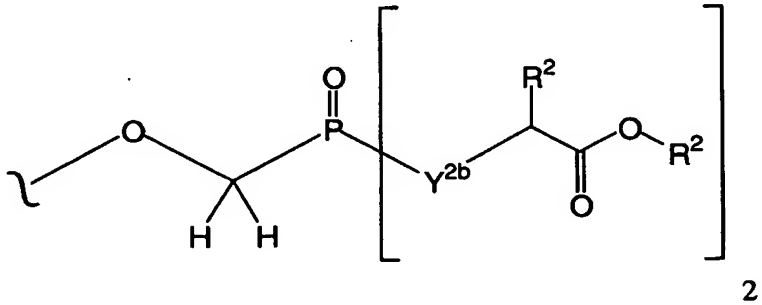


M12d ;

$Y^{2b}$ is O or $N(R^2)$; and

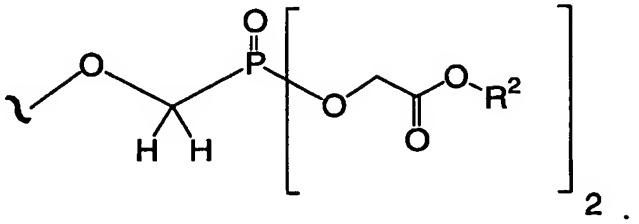
M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

60. The compound of claim 59 wherein $A^3$ is of the formula:

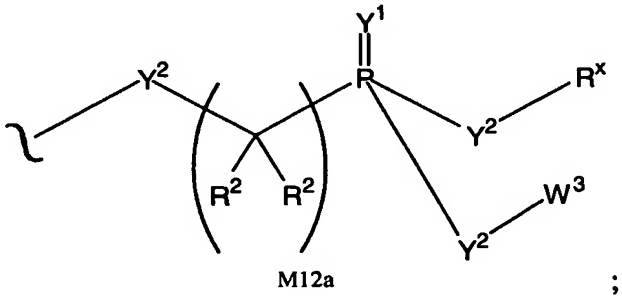


and $Y^{2b}$ is O or $N(R^2)$.

61. The compound of claim 60 wherein $A^3$ is of the formula:

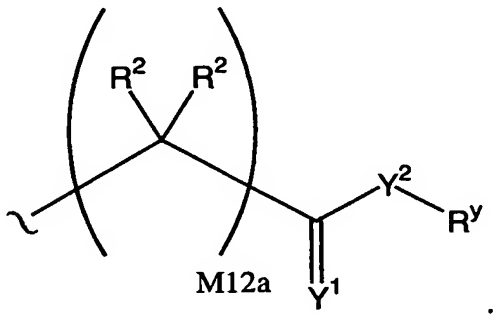


62. The compound of claim 3 wherein $A^3$ is of the formula:



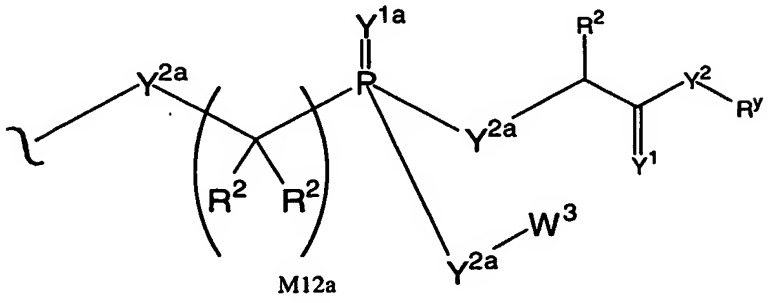
M12a ;

$R^x$ is of the formula:



M12a .

63. The compound of claim 62 wherein $A^3$ is of the formula:

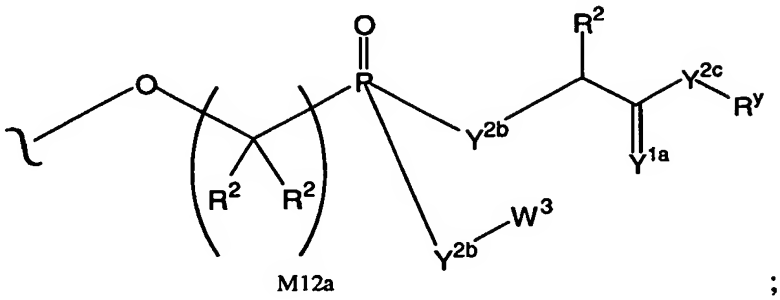


M12a ;

$Y^{1a}$ is O or S; and

$Y^{2a}$ is O, $N(R^2)$ or S.

64. The compound of claim 63 wherein $A^3$ is of the formula:

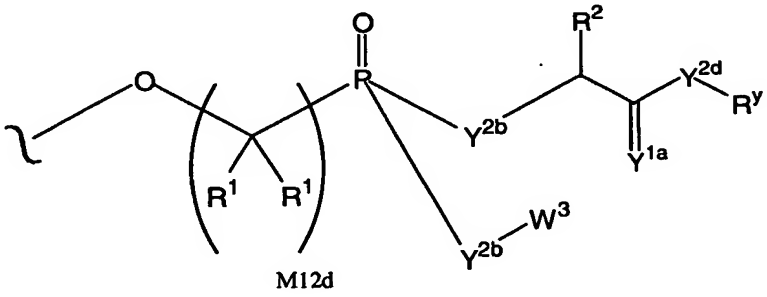


M12a ;

$Y^{2b}$ is O or $N(R^2)$; and

$Y^{2c}$ is O, $N(R^y)$ or S.

65. The compound of claim 64 wherein $A^3$ is of the formula:



M12d

$R^1$ is H or $C_1$–$C_{18}$ alkyl;

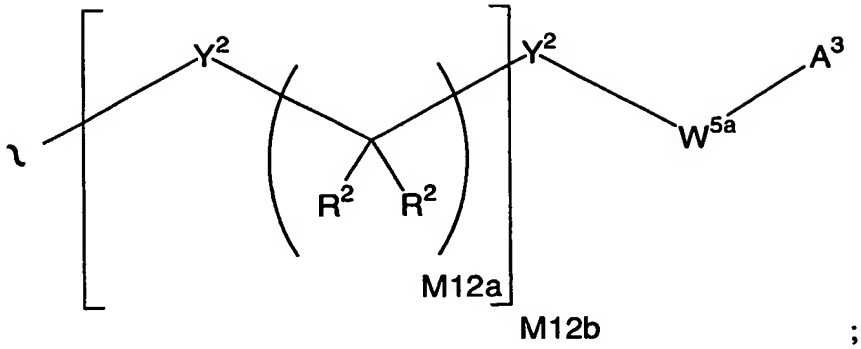
$Y^{2d}$ is O or $N(R^y)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

66. The compound of claim 65 wherein $R^1$ is H; and $Y^{1a}$ and $Y^{2d}$ are O.

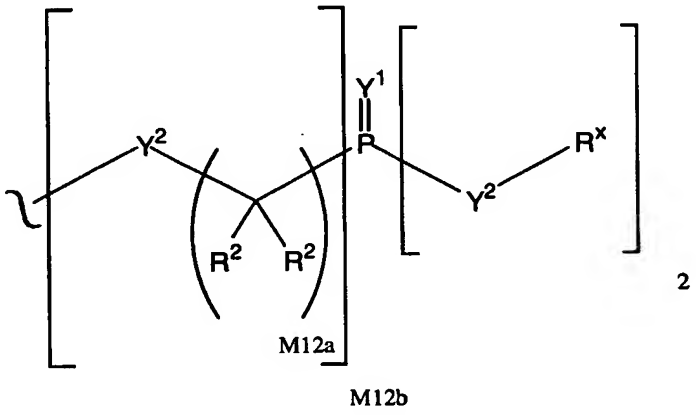
67. The compound of claim 66 wherein M12d is 1.

68. The compound of claim 3 wherein $A^1$ is of the formula:




; and

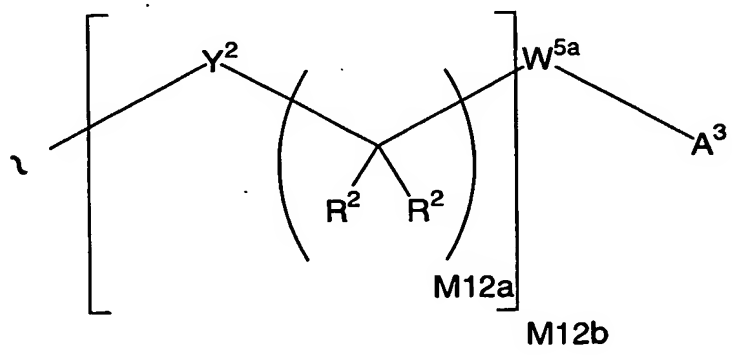
$A^3$ is of the formula:




.

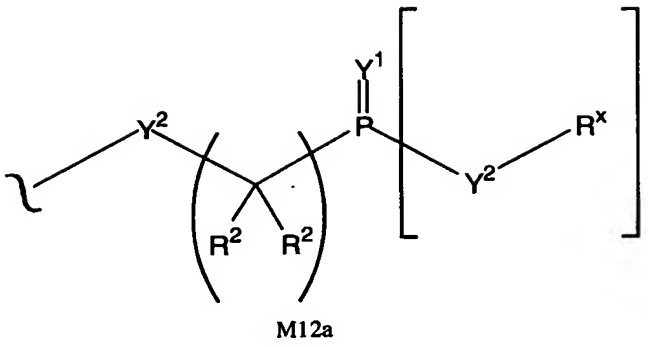
5

69. The compound of claim 68 wherein $A^1$ is of the formula:



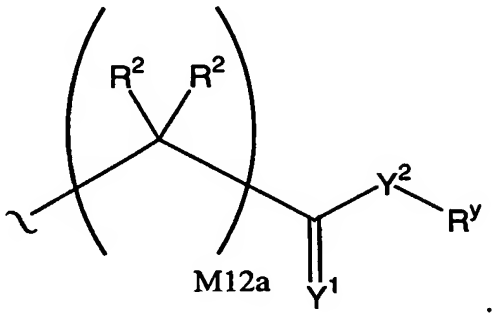

;

$A^3$ is of the formula:

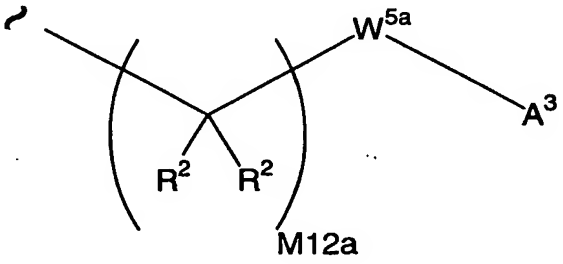



; and

$R^x$ is of the formula:

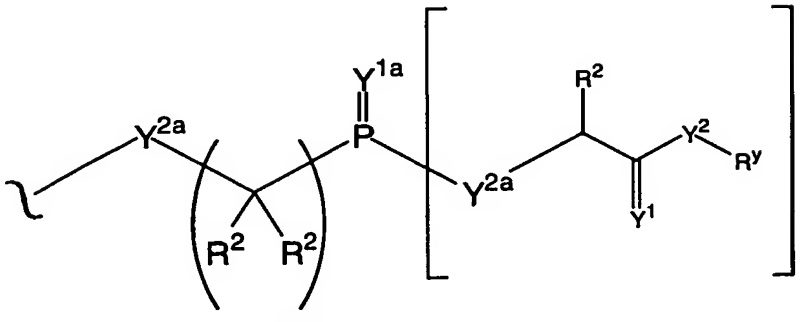



70. The compound of claim 69 wherein $A^1$ is of the formula:




;

$A^3$ is of the formula:

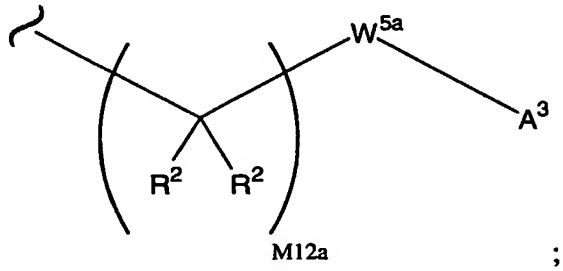



;

$Y^{1a}$ is O or S; and

$Y^{2a}$ is O, N($R^2$) or S.

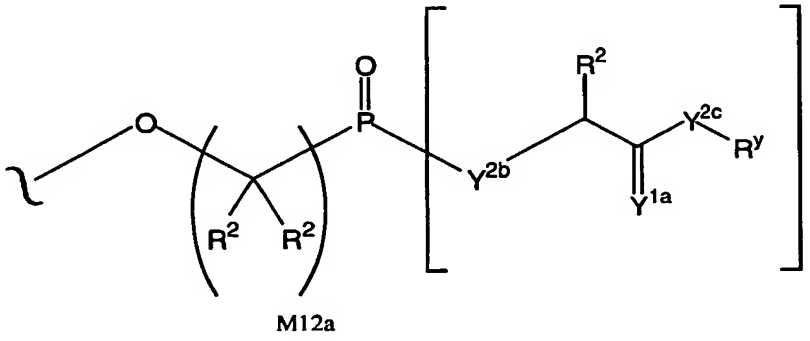
71. The compound of claim 70 wherein $A^1$ is of the formula:




M12a ;

$W^{5a}$ is a carbocycle independently substituted with 0 or 1 $R^2$ groups;

$A^3$ is of the formula:



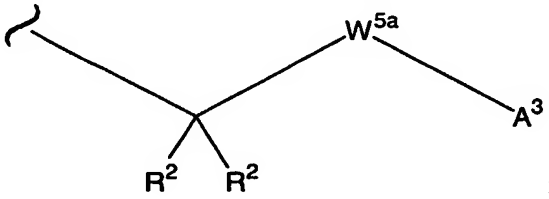

M12a 2 ;

$Y^{1a}$ is O or S;

$Y^{2b}$ is O or N($R^2$); and

$Y^{2c}$ is O, N($R^y$) or S.

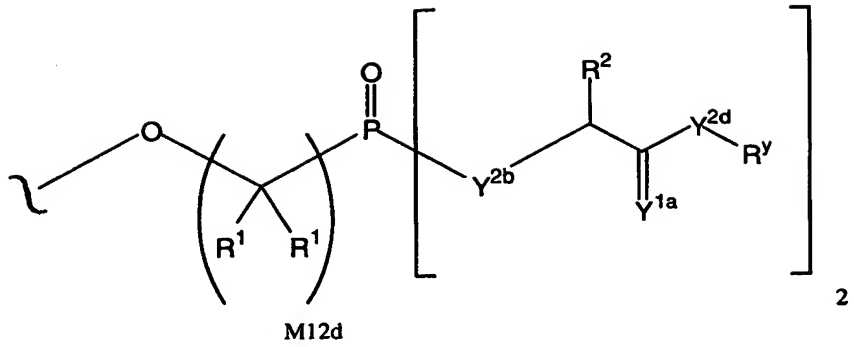
72. The compound of claim 71 wherein $A^1$ is of the formula:




;

$W^{5a}$ is a carbocycle independently substituted with 0 or 1 $R^2$ groups;

$A^3$ is of the formula:



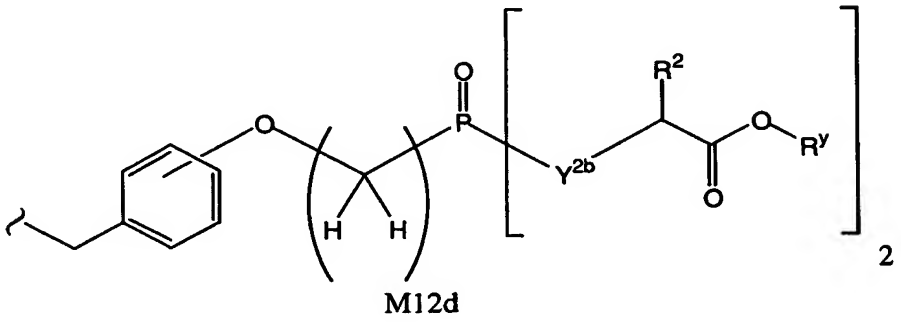

$Y^{1a}$ is O or S;

$Y^{2b}$ is O or $N(R^2)$;

$Y^{2d}$ is O or $N(R^y)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

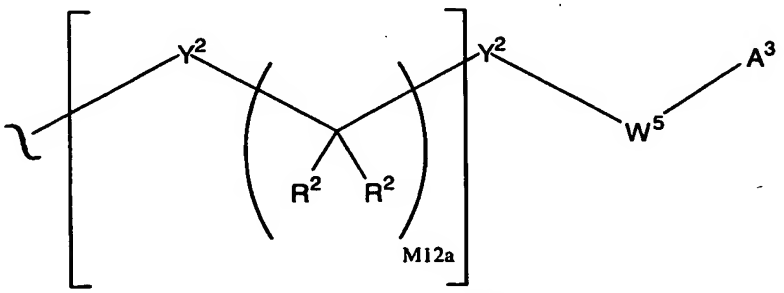
73. The compound of claim 72 wherein $A^1$ is of the formula:




$Y^{2b}$ is O or $N(R^2)$; and

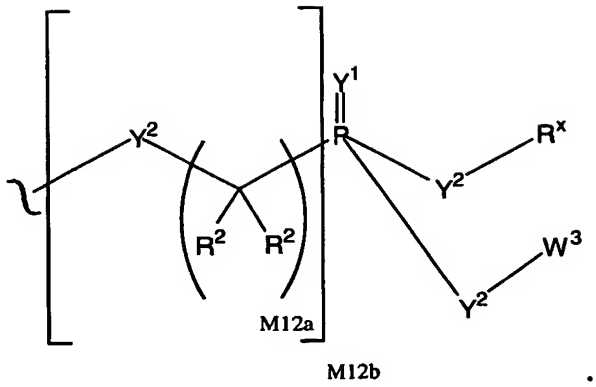
M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

74. The compound of claim 3 wherein $A^1$ is of the formula:



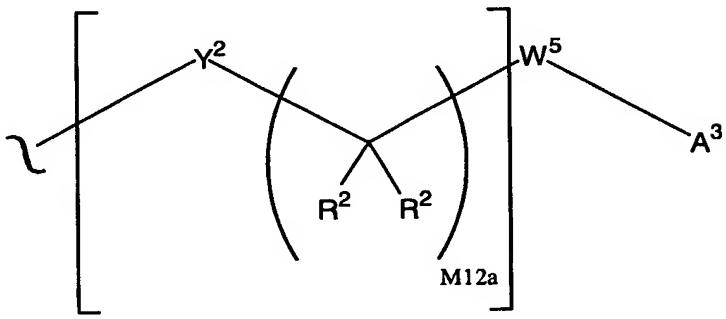

; and

$A^3$ is of the formula:



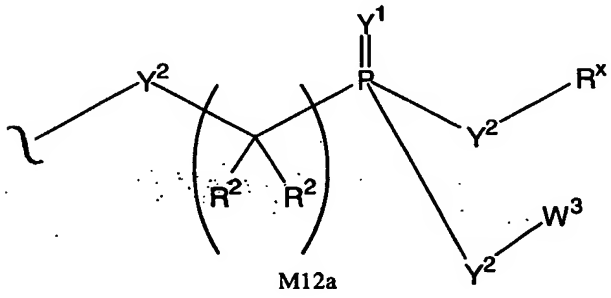

M12b

75. The compound of claim 74 wherein $A^1$ is of the formula:



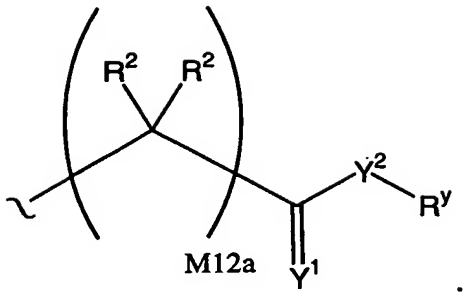

M12b ;

$A^3$ is of the formula:

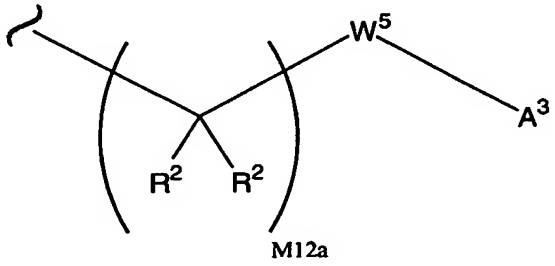



; and

$R^x$ is of the formula:

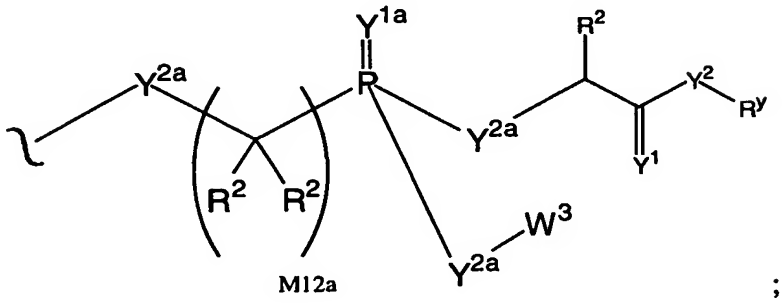



76. The compound of claim 75 wherein $A^1$ is of the formula:




;

$A^3$ is of the formula:

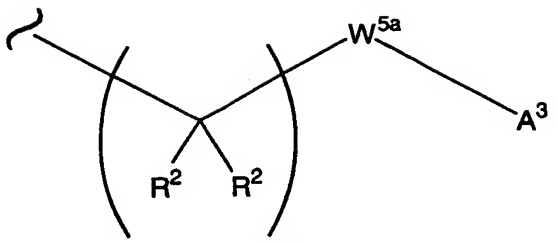



;

$Y^{1a}$ is O or S; and

$Y^{2a}$ is O, N($R^2$) or S.

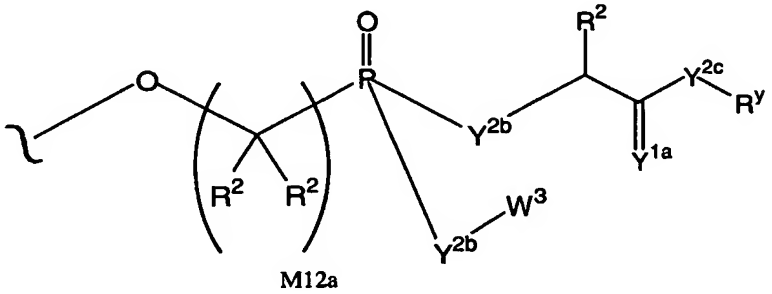
77. The compound of claim 76 wherein $A^1$ is of the formula:




M12a ;

$W^{5a}$ is a carbocycle independently substituted with 0 or 1 $R^2$ groups;

$A^3$ is of the formula:



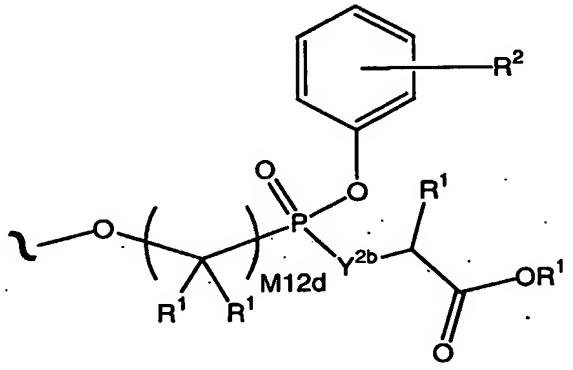

M12a ;

$Y^{1a}$ is O or S;

$Y^{2b}$ is O or N($R^2$); and

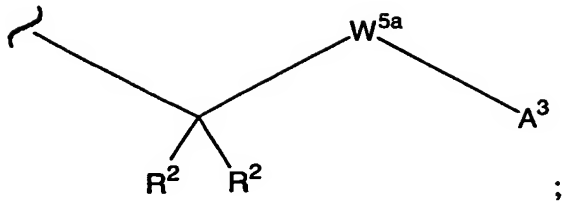
$Y^{2c}$ is O, N($R^y$) or S.

78. The compound of claim 77 wherein $A^3$ is of the formula:




wherein the phenyl carbocycle is substituted with 0 to 3 $R^2$ groups.

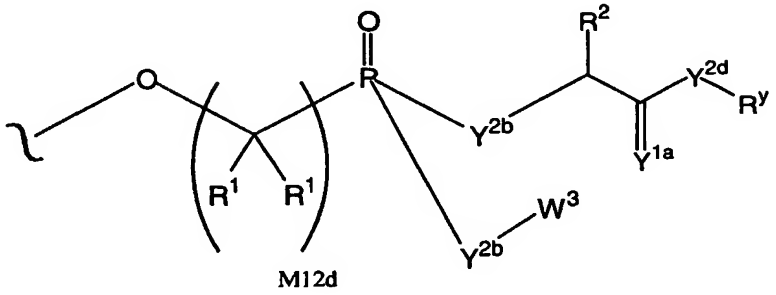
79. The compound of claim 75 wherein $A^1$ is of the formula:




;

$W^{5a}$ is a carbocycle or heterocycle where $W^{5a}$ is independently substituted with 0 or 1 $R^2$ groups;

$A^3$ is of the formula:



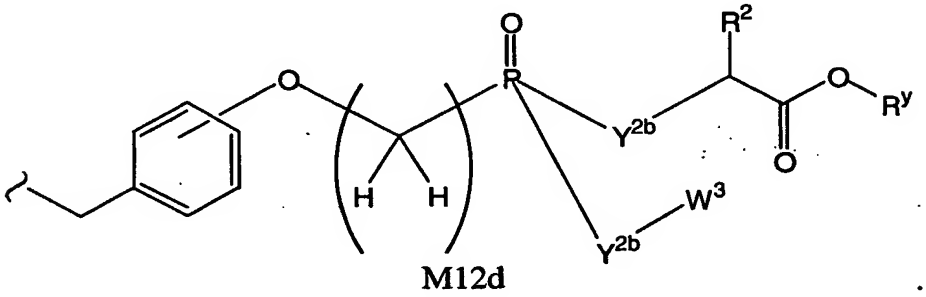

$Y^{1a}$ is O or S;

$Y^{2b}$ is O or N($R^2$);

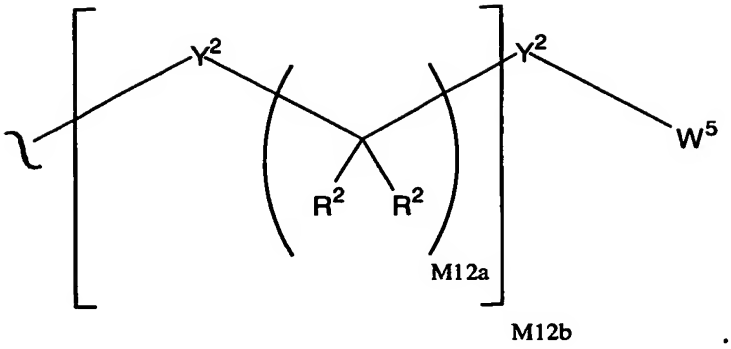
$Y^{2d}$ is O or N($R^y$); and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

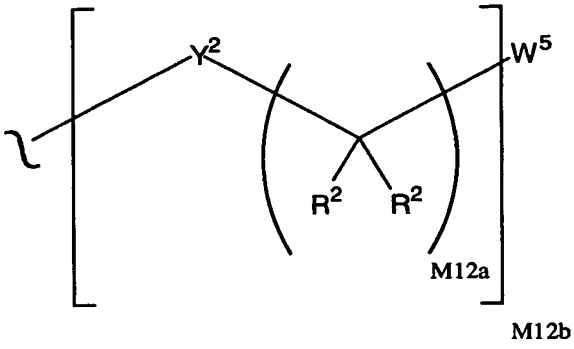
80. The compound of claim 79 wherein $A^1$ is of the formula:




81. The compound of claim 3 wherein $A^2$ is of the formula:



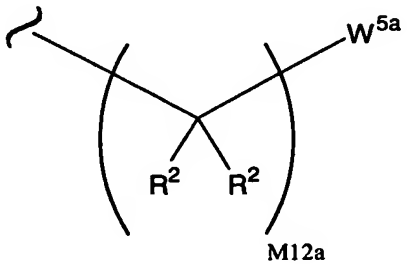

82. The compound of claim 81 wherein $A^2$ is of the formula:




83. The compound of claim 82 wherein M12b is 1.

84. The compound of claim 82 where M12b is 0, $Y^2$ is a bond and $W^5$ is a carbocycle or heterocycle where $W^5$ is optionally and independently substituted with 1, 2, or 3 $R^2$ groups.

85. The compound of claim 82 wherein $A^2$ is of the formula:



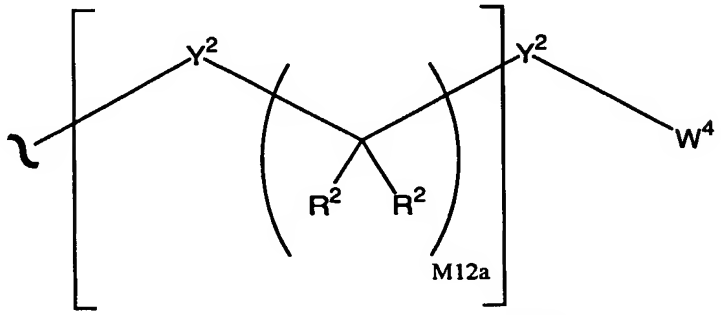

;

and $W^{5a}$ is a carbocycle or heterocycle where $W^{5a}$ is optionally and independently substituted with 1, 2, or 3 $R^2$ groups.

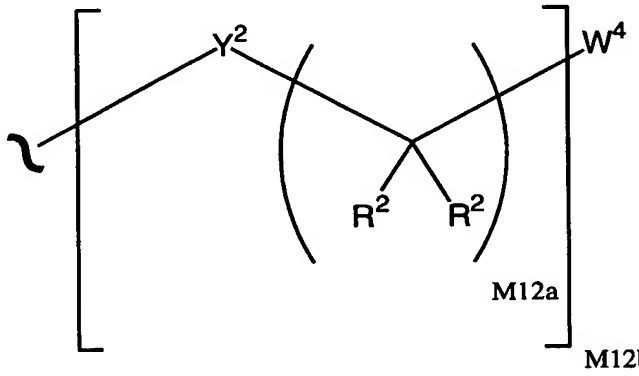
86. The compound of claim 85 wherein M12a is 1.

87. The compound of claim 86 wherein $A^2$ is selected from phenyl, substituted phenyl, benzyl, substituted benzyl, pyridyl and substituted pyridyl.

88. The compound of claim 3 wherein $A^2$ is of the formula:

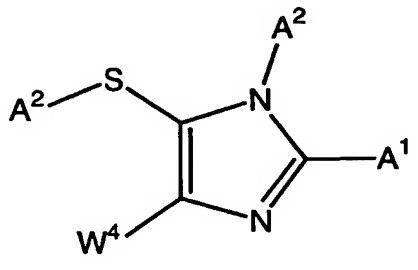



89. The compound of claim 88 wherein $A^2$ is of the formula:

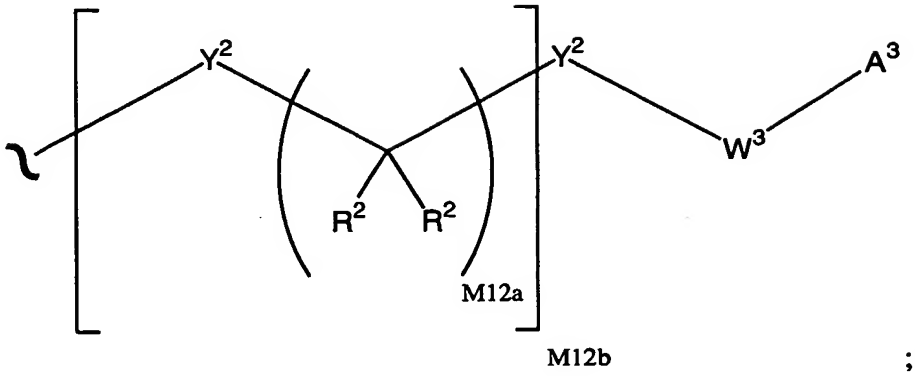



90. The compound of claim 89 wherein M12b is 1.

91. The compound of claim 6 having the formula:

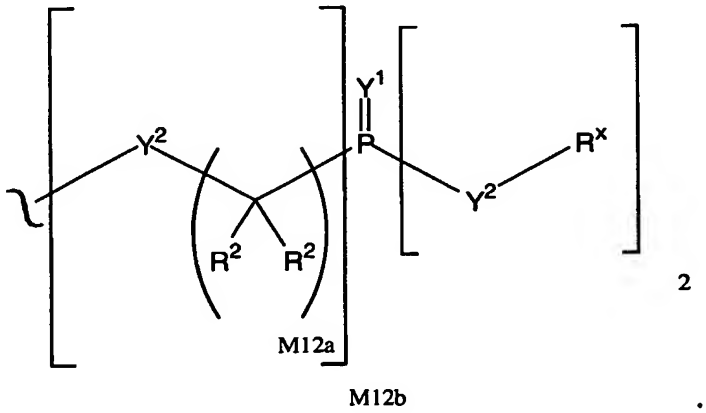


wherein $A^1$ is of the formula:




; and

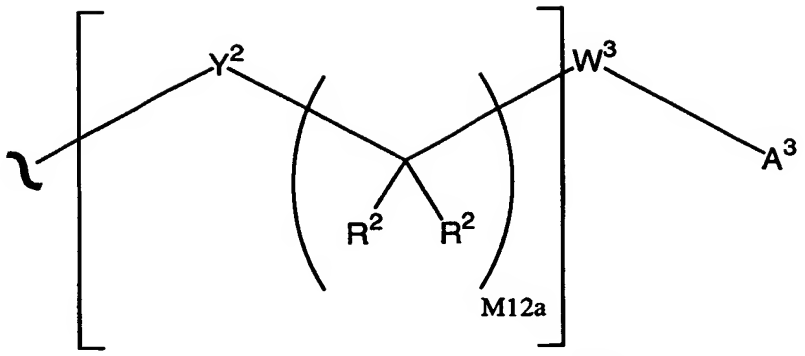
$A^3$ is of the formula:




92. The compound of claim 91 wherein $A^2$ is selected from phenyl, substituted phenyl, benzyl, substituted benzyl, pyridyl and substituted pyridyl.

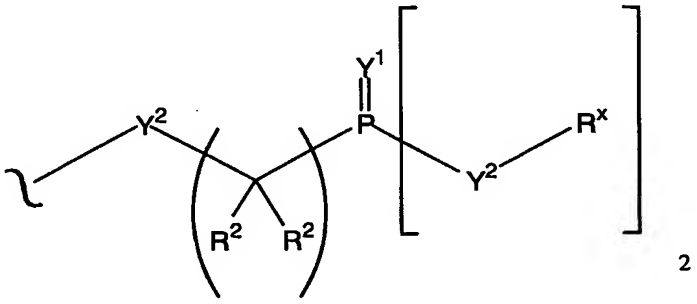
93. The compound of claim 92 wherein substituted phenyl, substituted benzyl, and substituted pyridyl are independently substituted with 1, 2 or 3 $R^2$ groups.

94. The compound of claim 91 wherein $A^1$ is of the formula:



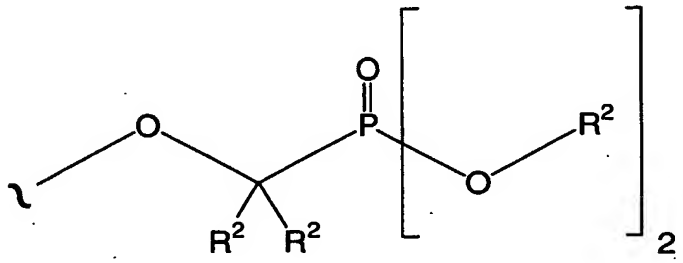

M12b ; and

$A^3$ is of the formula:

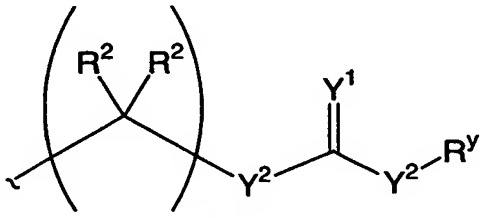



M12a .

95. The compound of claim 94 wherein $A^3$ is of the formula:

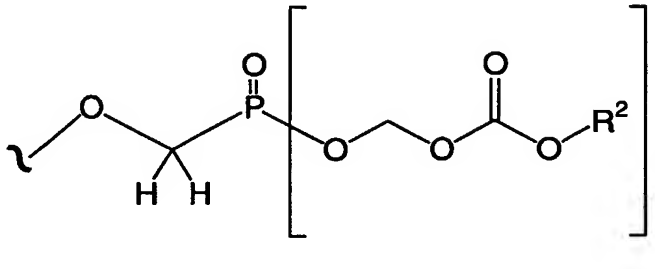



96. The compound of claim 94 wherein $R^x$ is of the formula:

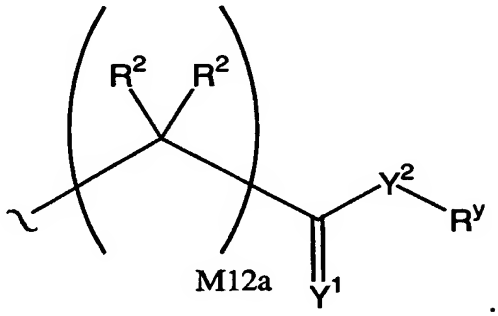



M12a .

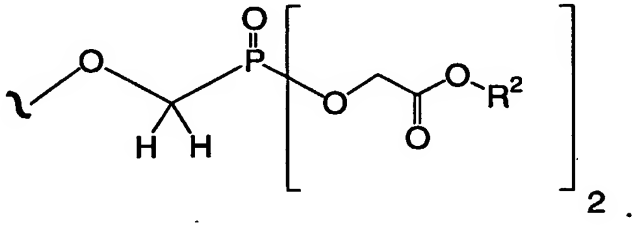
97. The compound of claim 96 wherein $A^3$ is of the formula:



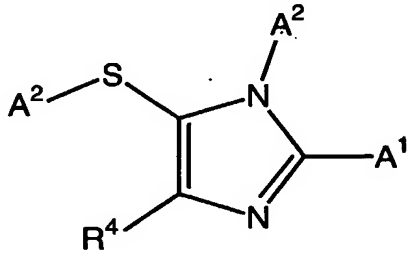
98. The compound of claim 95 wherein $R^x$ is of the formula:



99. The compound of claim 98 wherein $A^3$ is of the formula:

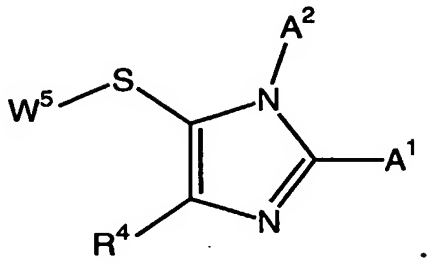


100. The compound of claim 91 having the formula:

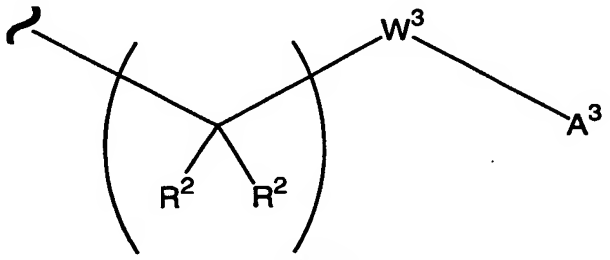


101. The compound of claim 100 wherein $R^4$ is isopropyl.

102. The compound of claim 100 having the formula:

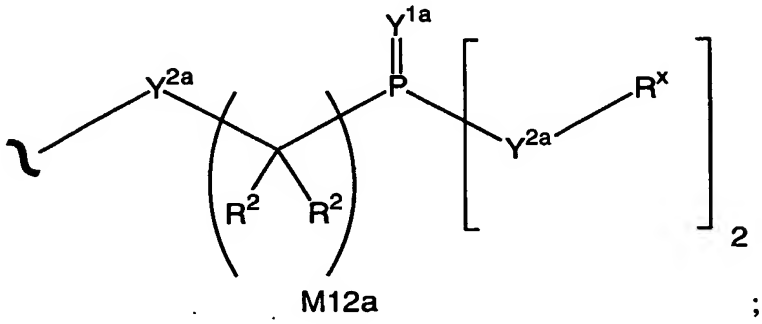


103. The compound of claim 100 wherein $A^1$ is of the formula:



M12a ;

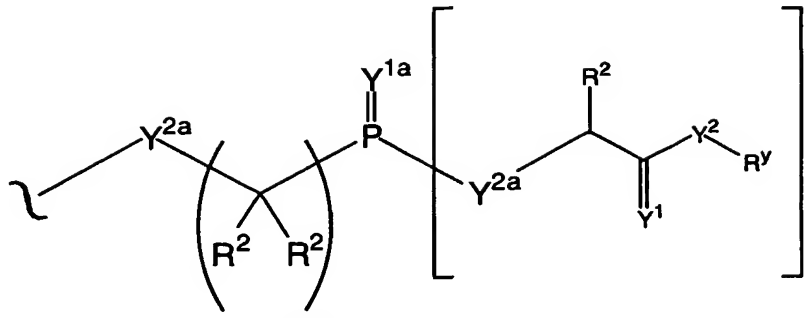
$A^3$ is of the formula:



M12a ;

and $Y^{1a}$ is O or S.

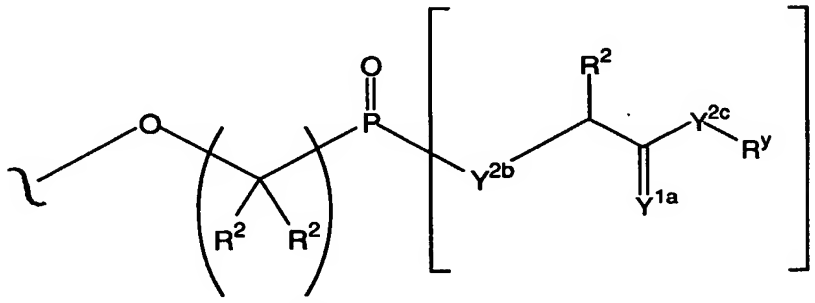
104. The compound of claim 103 wherein $A^3$ is of the formula:



M12a ;

and $Y^{2a}$ is O, N($R^2$) or S.

105. The compound of claim 104 wherein $A^3$ is of the formula:

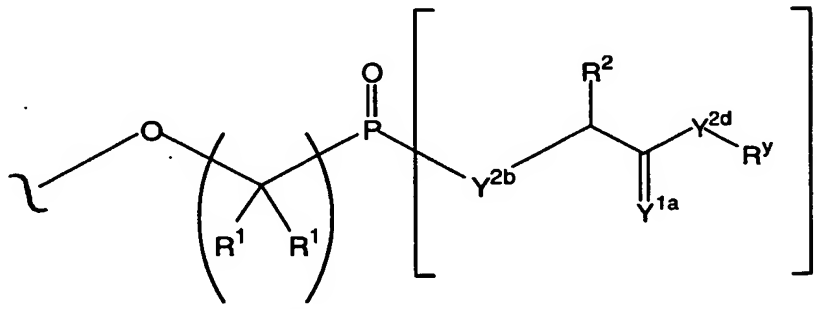


M12a ;

$Y^{2b}$ is O or N($R^2$); and

$Y^{2c}$ is O, N($R^y$) or S.

106. The compound of claim 105 wherein $A^3$ is of the formula:



M12d ;

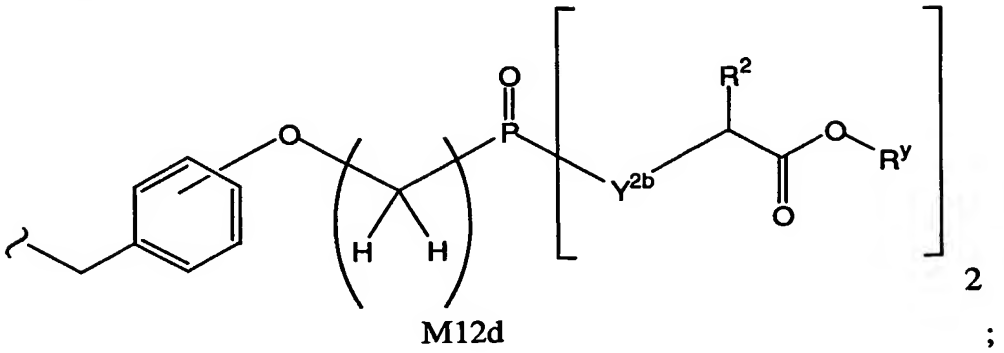
$Y^{1a}$ is O or S;

$Y^{2b}$ is O or N($R^2$);

$Y^{2d}$ is O or N($R^y$); and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

107. The compound of claim 106 wherein $A^1$ is of the formula:

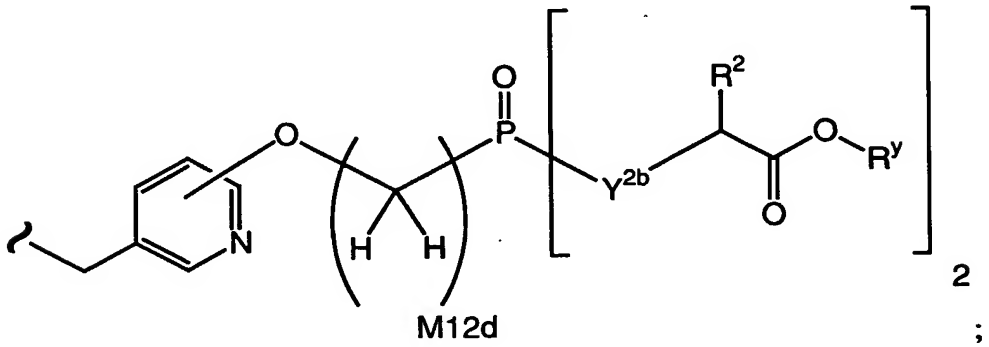



M12d ;

$Y^{2b}$ is O or $N(R^2)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

108. The compound of claim 106 wherein $A^1$ is of the formula:

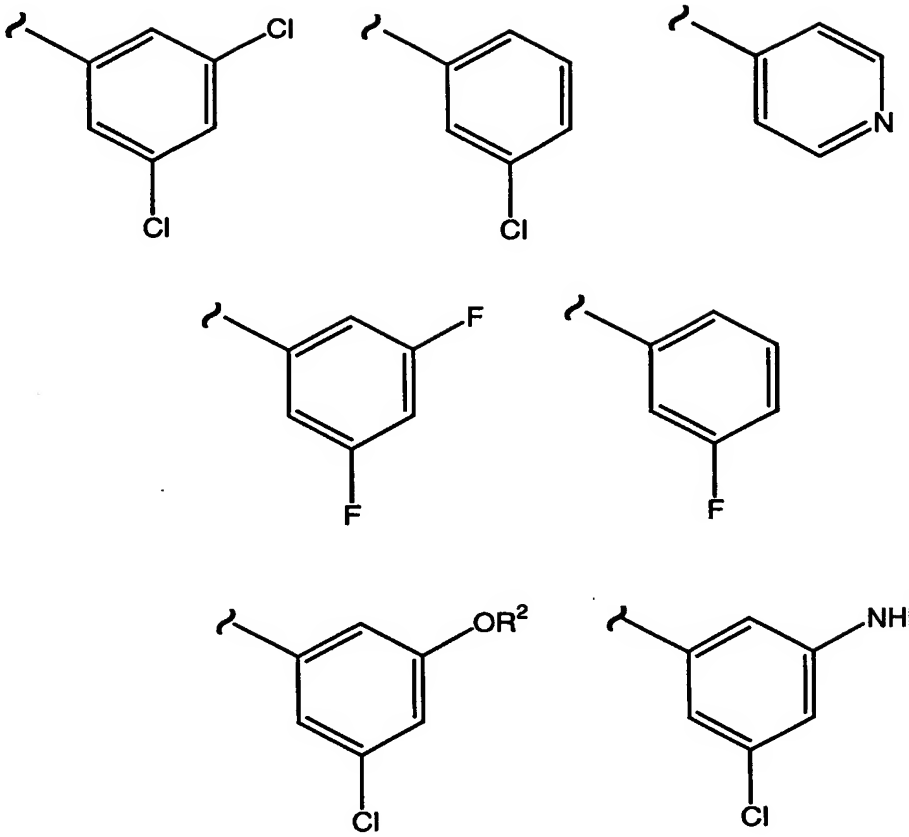



M12d ;

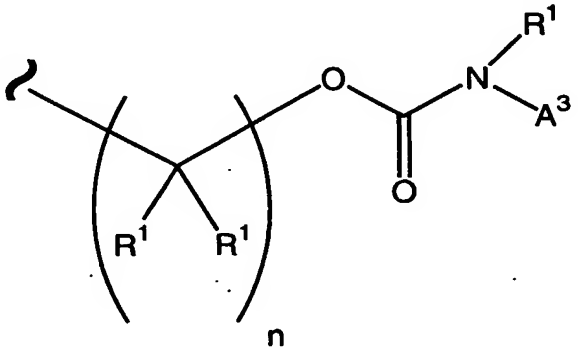
and $Y^{2b}$ is O or $N(R^2)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

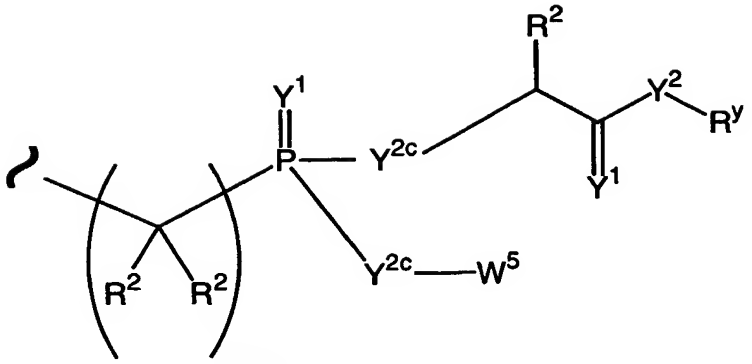
109. The compound of claim 102 wherein $W^5$ is selected from the structures:




110. The compound of claim 91 wherein $A^1$ is of the formula:




n is an integer from 1 to 18; $A^3$ is of the formula:

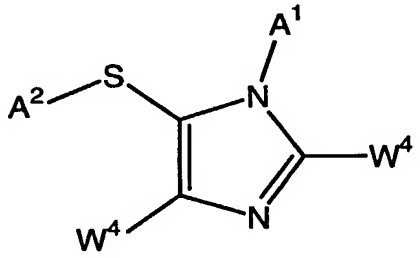


M12a ;

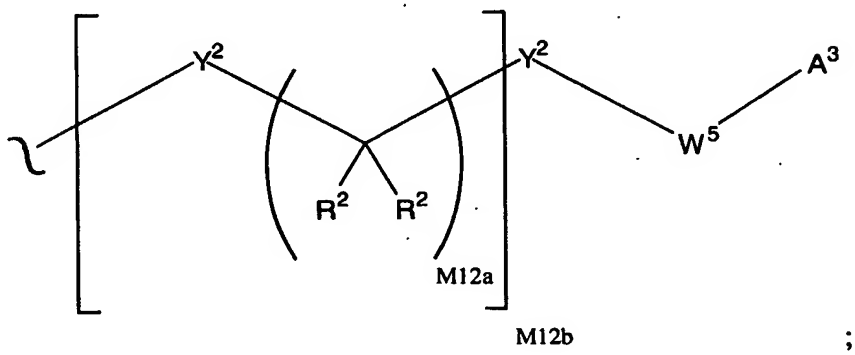
and $Y^{2c}$ is O, N($R^y$) or S.

111. The compound of claim 110 wherein $R^1$ is H and n is 1.

112. The compound of claim 5 having the formula:



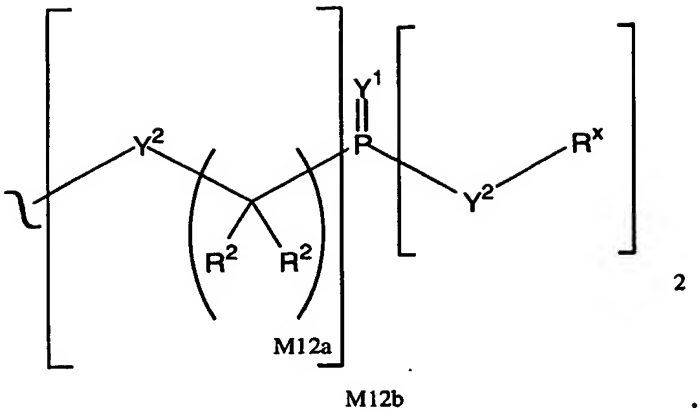
wherein $A^1$ is of the formula:



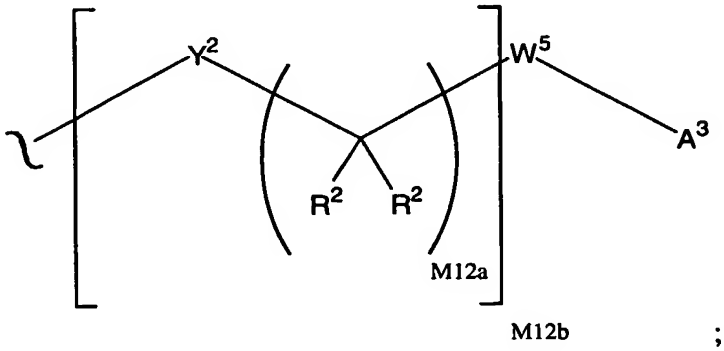
M12a

M12b ;

and $A^3$ is of the formula:

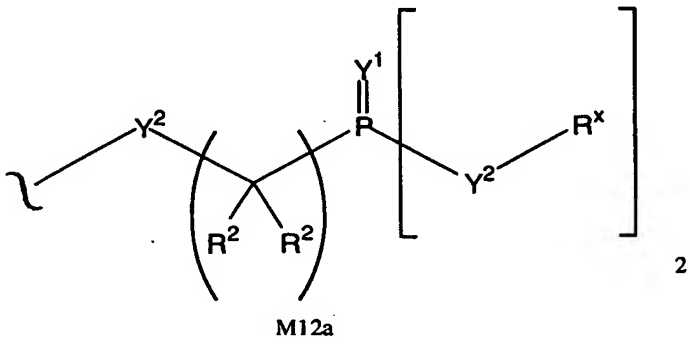



113. The compound of claim 112 wherein $A^1$ is of the formula:

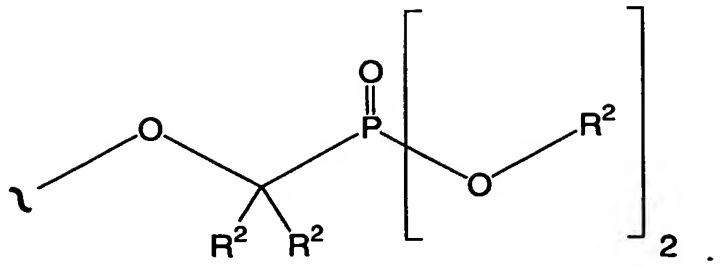



; and

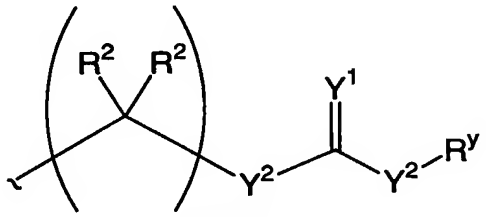
$A^3$ is of the formula:




114. The compound of claim 113 wherein $A^3$ is of the formula:

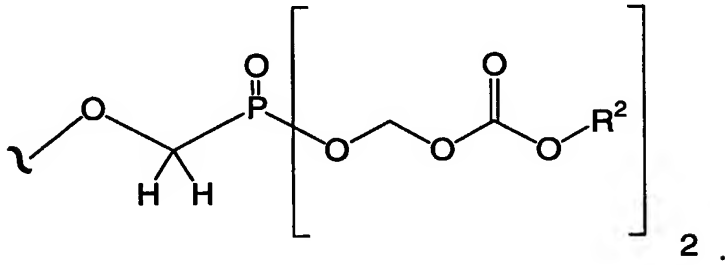


115. The compound of claim 113 wherein $R^x$ is of the formula:

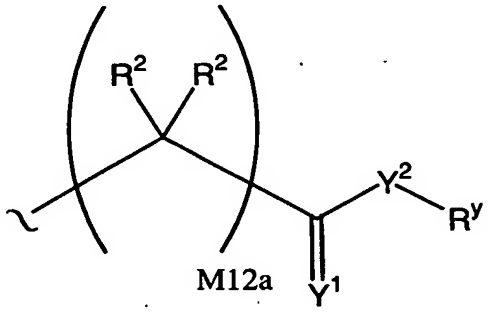


M12a

116. The compound of claim 115 wherein $A^3$ is of the formula:

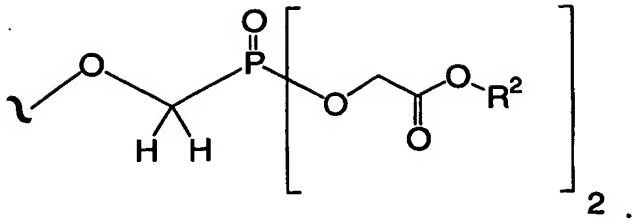


117. The compound of claim 113 wherein $R^x$ is of the formula:

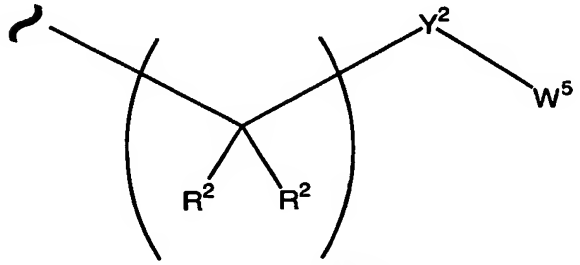


M12a

118. The compound of claim 117 wherein $A^3$ is of the formula:



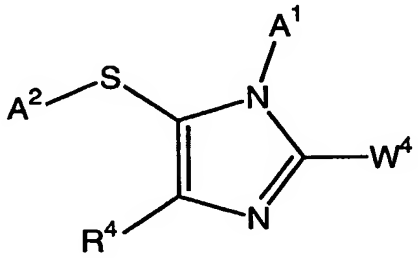
119. The compound of claim 112 wherein $A^2$ is selected from:



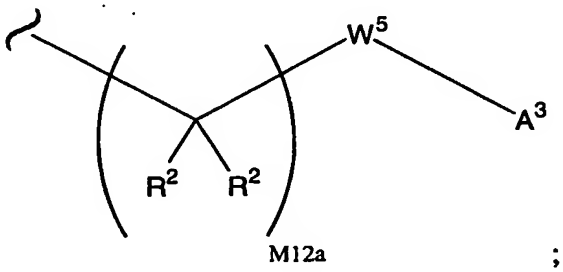
M12a , $Y^2$–$W^5$ and $W^5$,

where $W^5$ is a carbocycle or a heterocycle and where $W^5$ is independently substituted with 0 to 3 $R^2$ groups.

120. The compound of claim 112 having the formula:

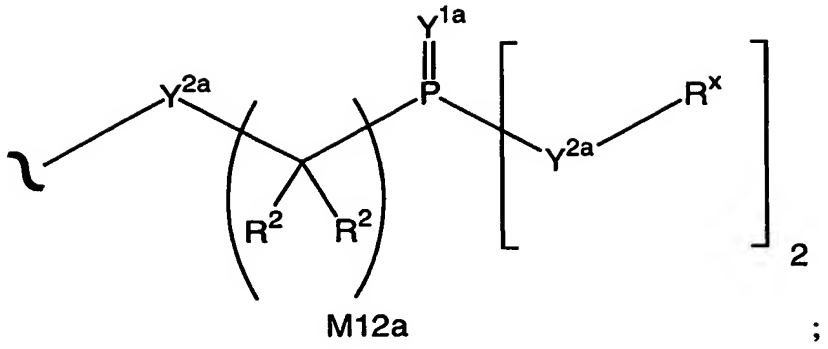


wherein $A^1$ is of the formula:



M12a ;

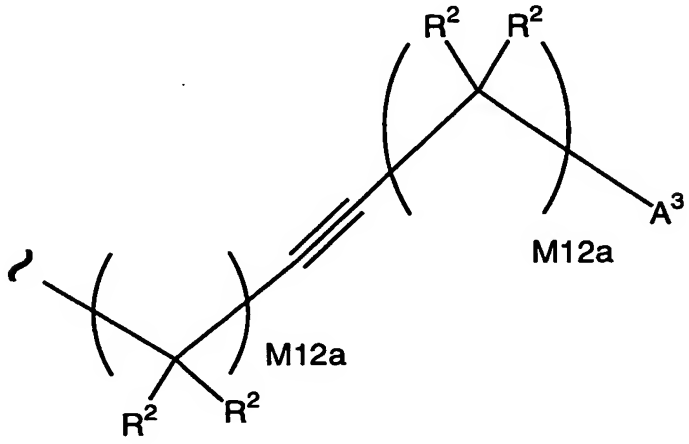
$A^3$ is of the formula:



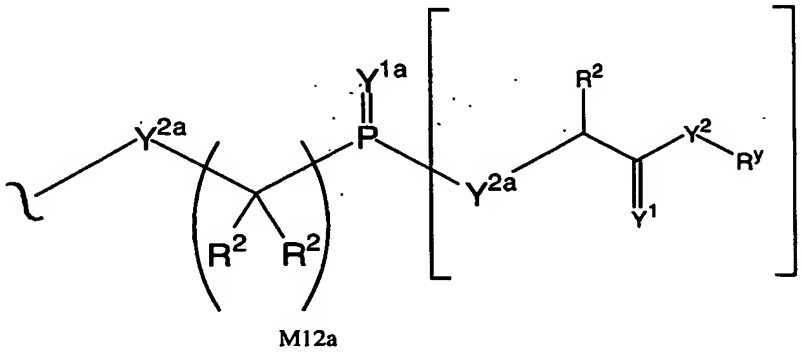

;

and $Y^{1a}$ is O or S.

121. The compound of claim 120 wherein $A^1$ is of the formula:



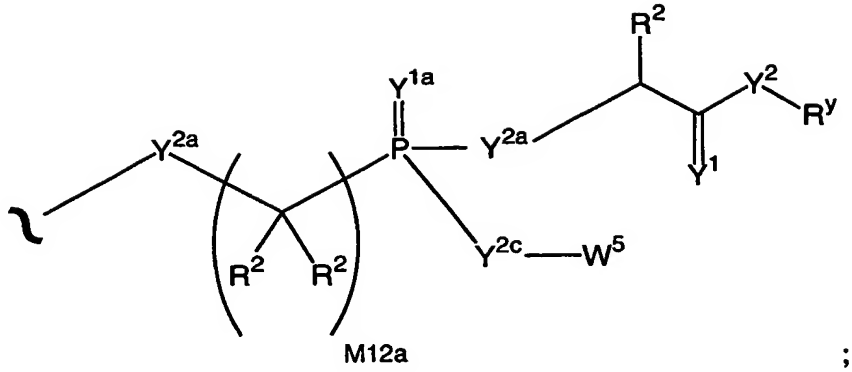

122. The compound of claim 120 wherein $A^3$ is of the formula:




;

and $Y^{2a}$ is O, $N(R^2)$ or S.

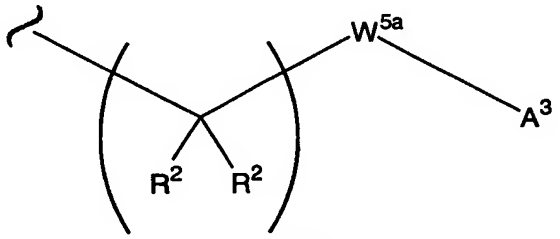
123. The compound of claim 112 wherein $A^3$ is of the formula:




M12a ;

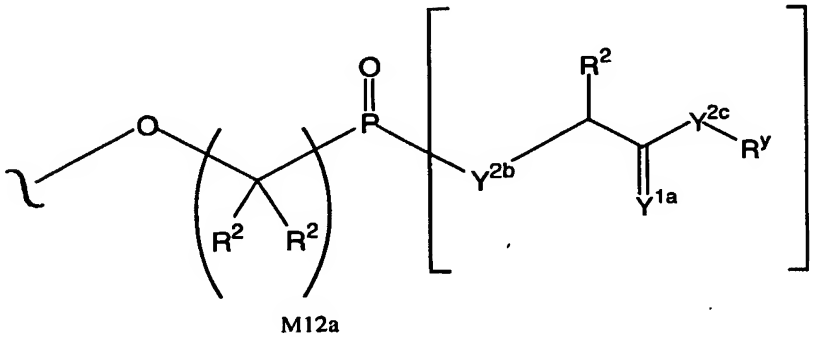
and $Y^{2c}$ is O, N($R^y$) or S.

124. The compound of claim 112 wherein $A^1$ is of the formula:




M12a ;

$A^3$ is of the formula:



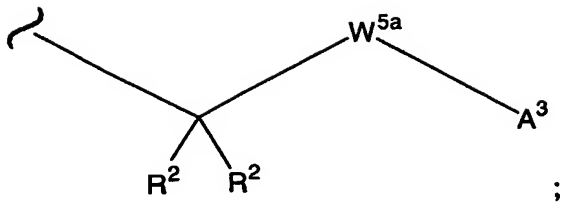

M12a ;

$W^{5a}$ is a carbocycle or a heterocycle where the carbocycle or heterocycle is independently substituted with 0 to 3 $R^2$ groups;

$Y^{2b}$ is O or N($R^2$); and

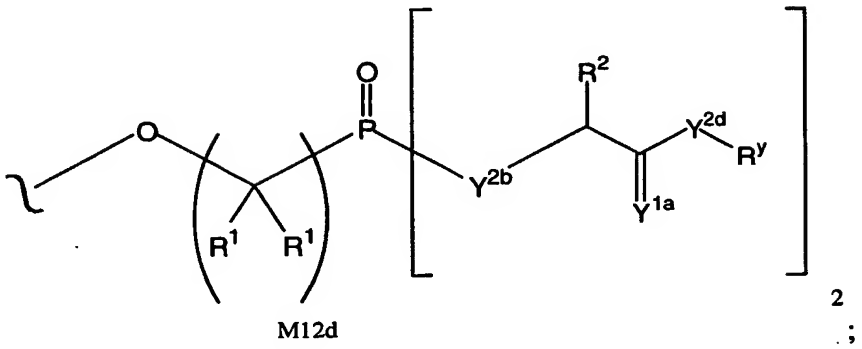
$Y^{2c}$ is O, N($R^y$) or S.

125. The compound of claim 124 wherein $A^1$ is of the formula:




;

$A^3$ is of the formula:




;

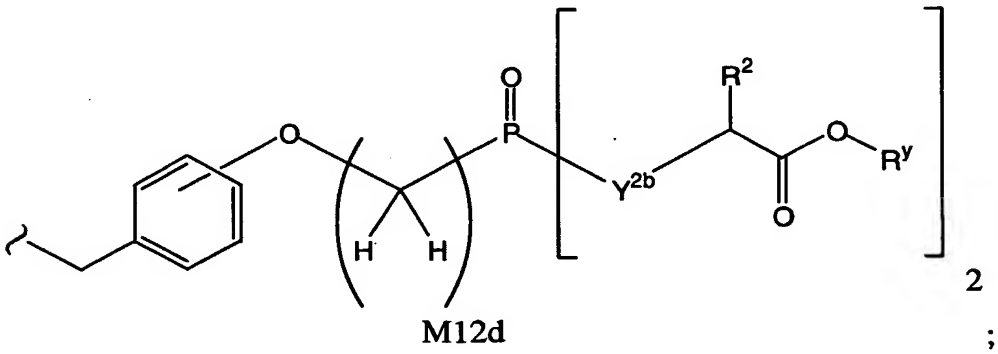
$Y^{1a}$ is O or S;

$Y^{2b}$ is O or $N(R^2)$;

$Y^{2d}$ is O or $N(R^y)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

126. The compound of claim 125 wherein $A^1$ is of the formula:

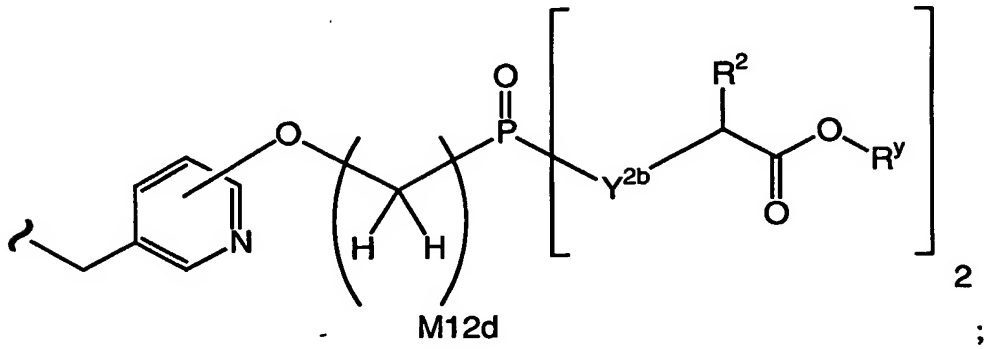



;

$Y^{2b}$ is O or $N(R^2)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

127. The compound of claim 126 wherein $A^1$ is of the formula:



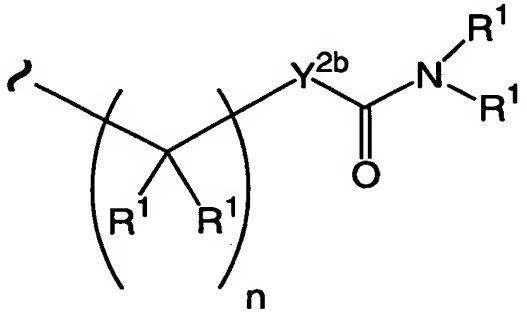
M12d ;

and $Y^{2b}$ is O or $N(R^2)$; and

M12d is 1, 2, 3, 4, 5, 6, 7 or 8.

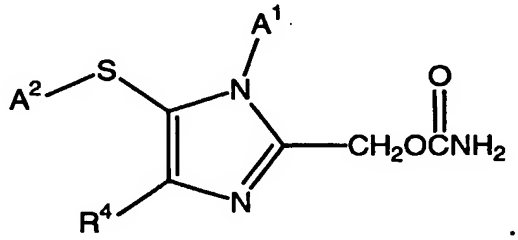
128. The compound of claim 112 wherein $A^2$ is a phenyl substituted with 0 to 3 $R^2$ groups.

129. The compound of claim 120 wherein $W^4$ is of the formula:

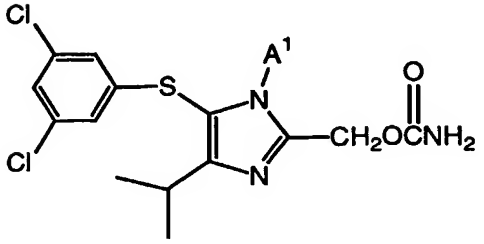


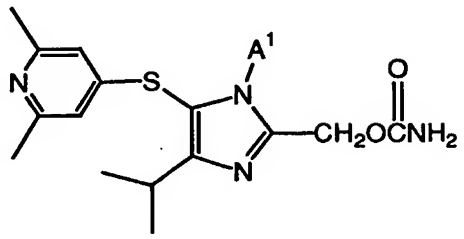
wherein n is an integer from 1 to 18; and $Y^{2b}$ is O or $N(R^2)$.

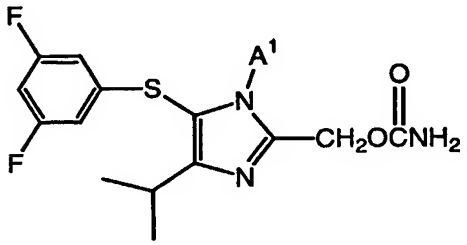
130. The compound of claim 129 having the formula:

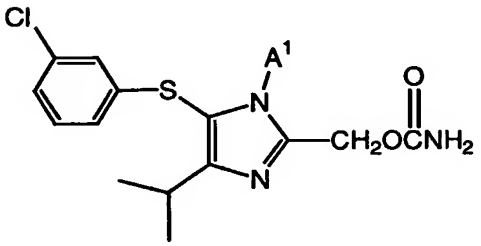


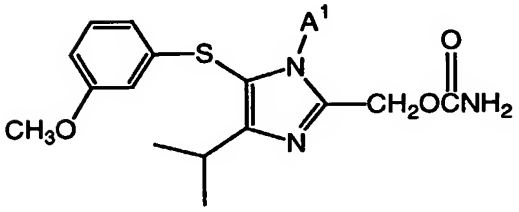
131. A compound of claim 130 selected from the formulas:



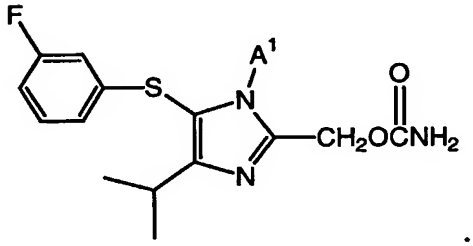




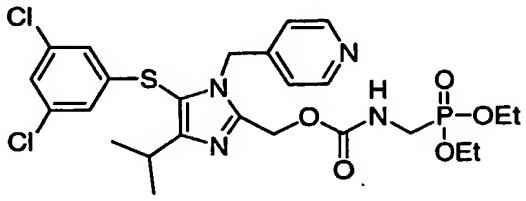




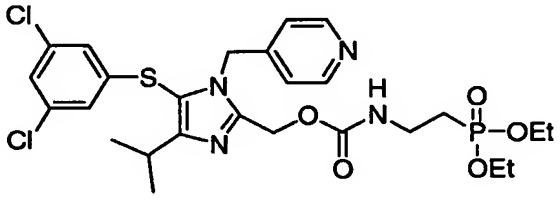
and



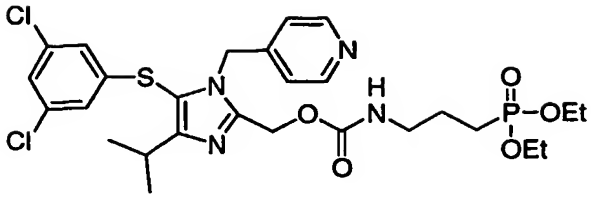
132. A compound of claim 6 selected from the structures:



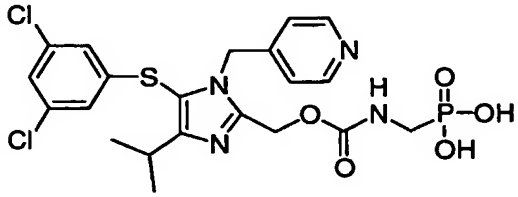
17



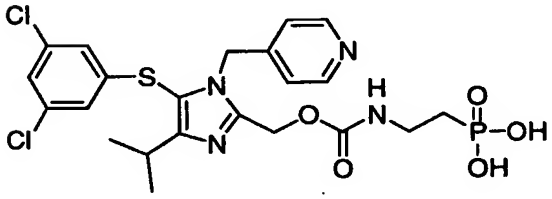
18



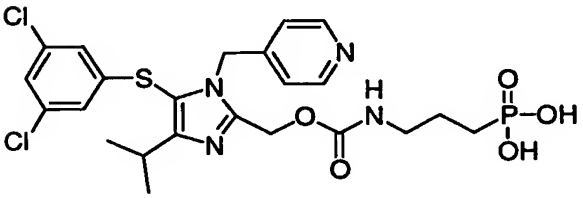
23



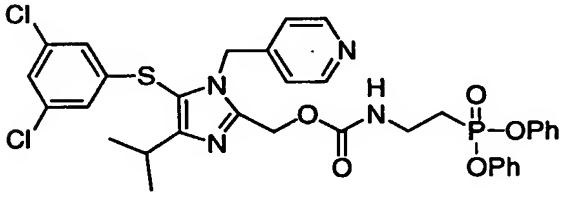
24



25

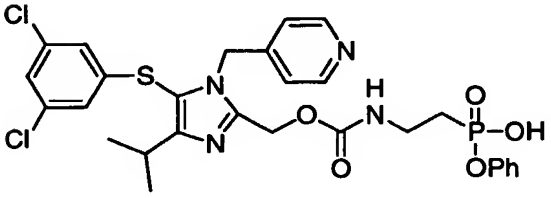


26



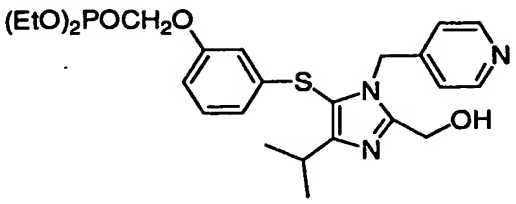
31

and

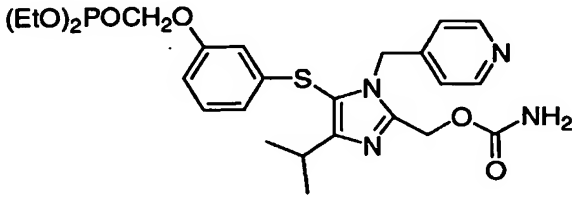


32.

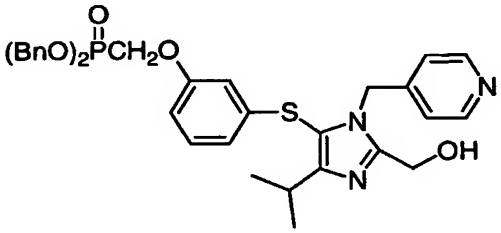
133. A compound of claim 4 selected from the structures:



40

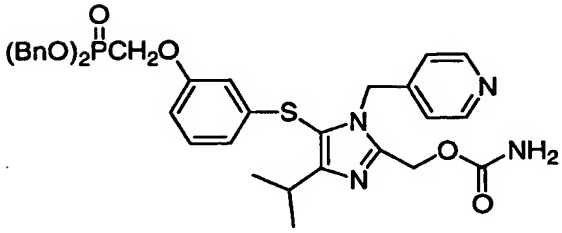


41



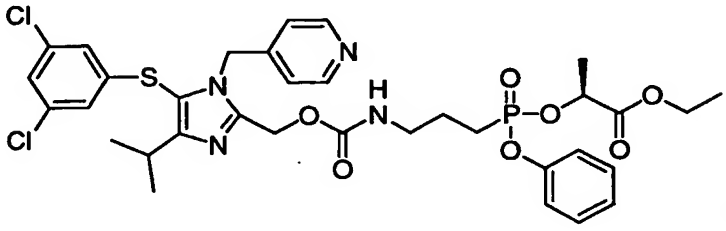
42

and

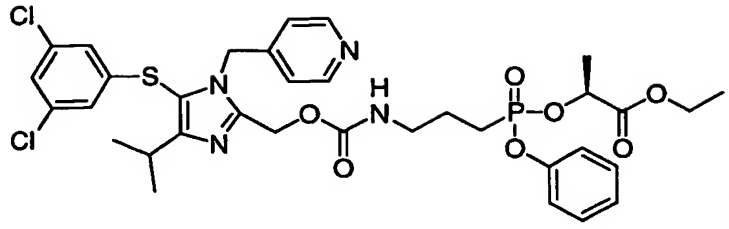


43.

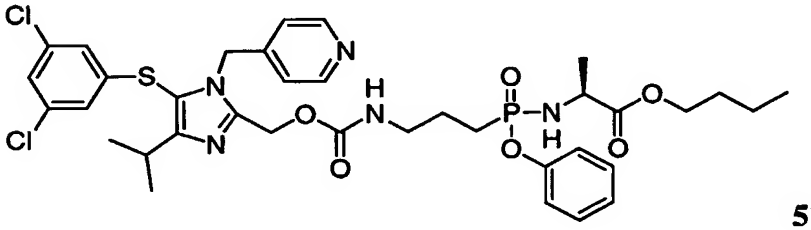
134. A compound of claim 6 selected from the structures:



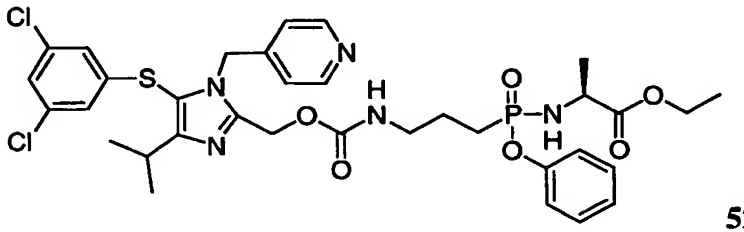
48



49

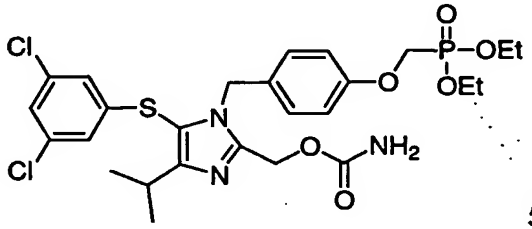


51

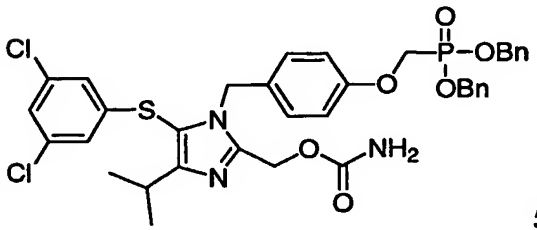


52 .

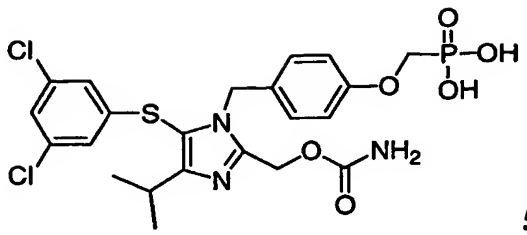
135. A compound of claim 5 selected from the structures:



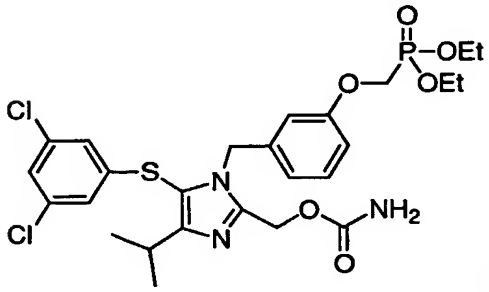
57



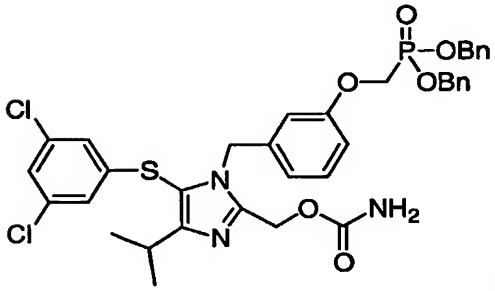
58



59

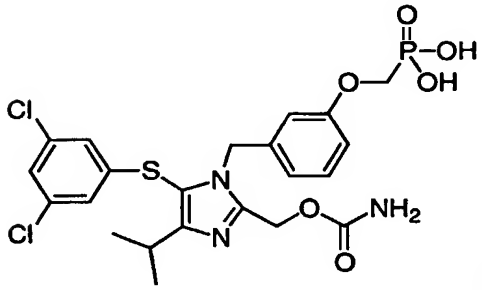


60



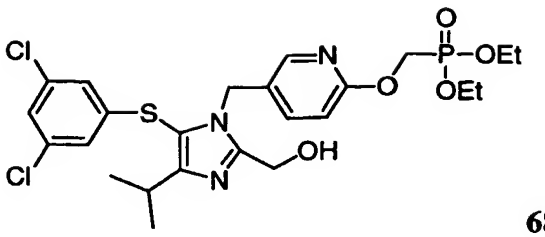
61

and

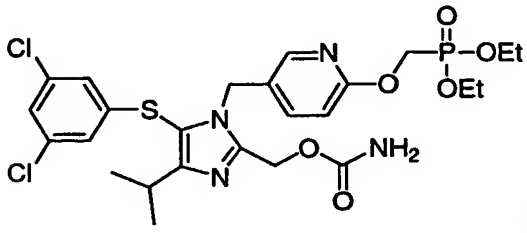


62.

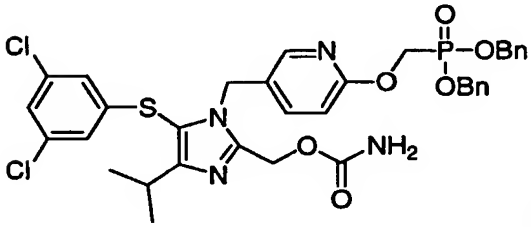
136. A compound of claim 5 selected from the structures:



68



69



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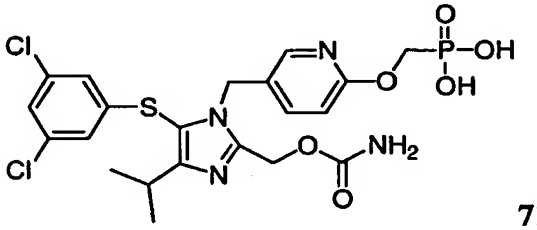
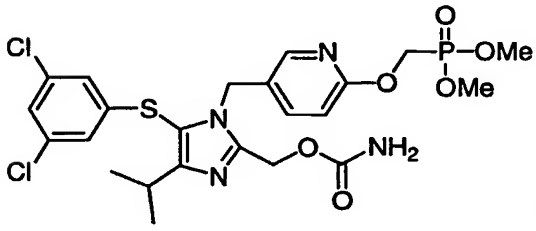
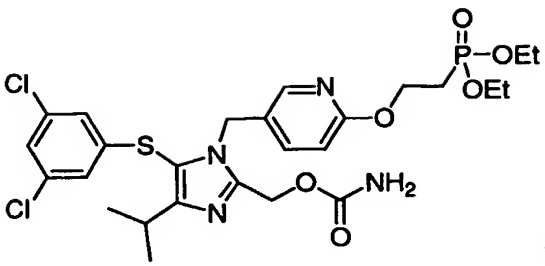


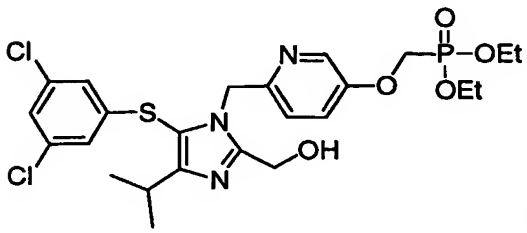
71



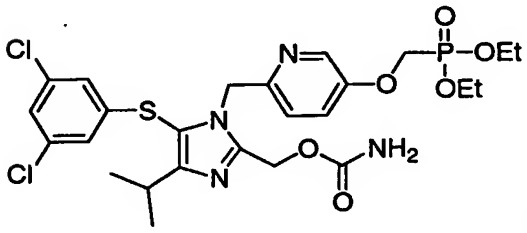
72



73



74



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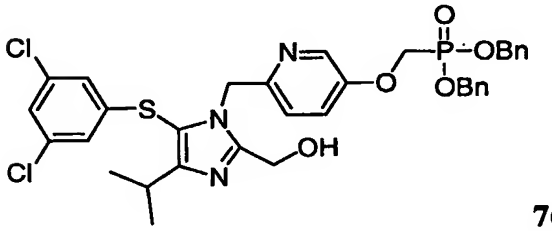
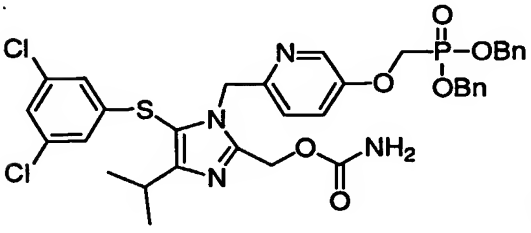
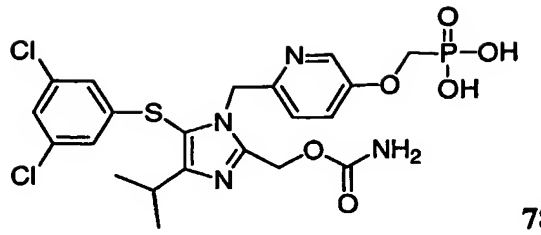


76



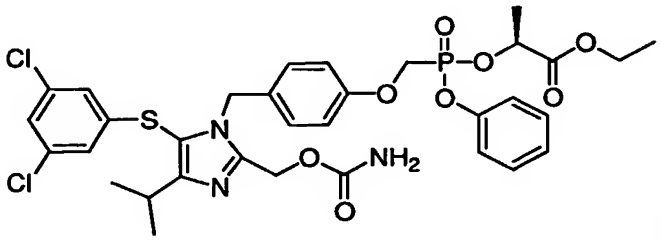
77

and

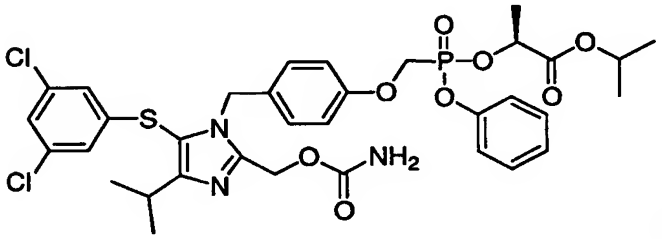


78 .

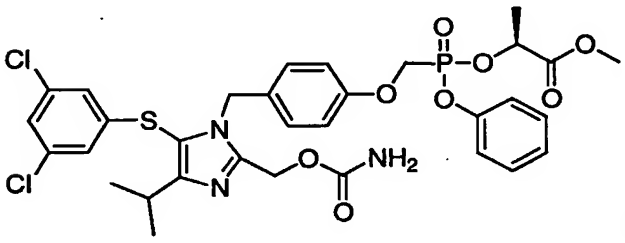
137. A compound of claim 5 selected from the structures:



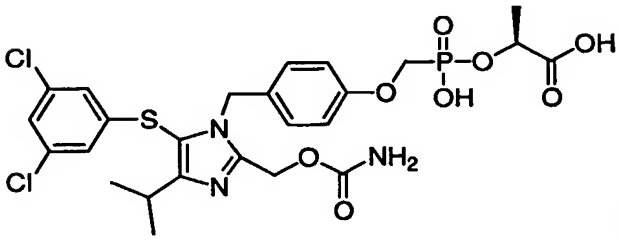
81



82



83



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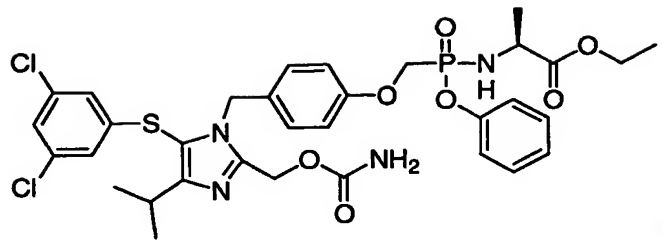
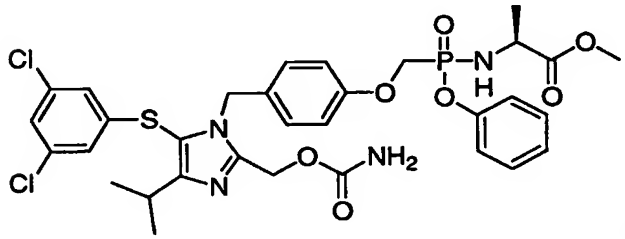
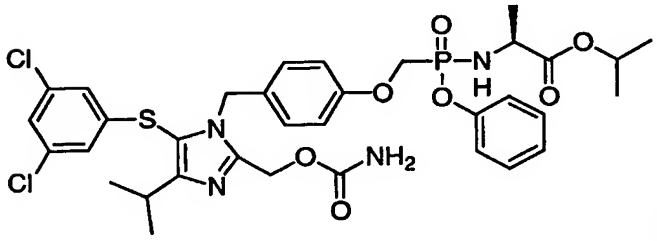


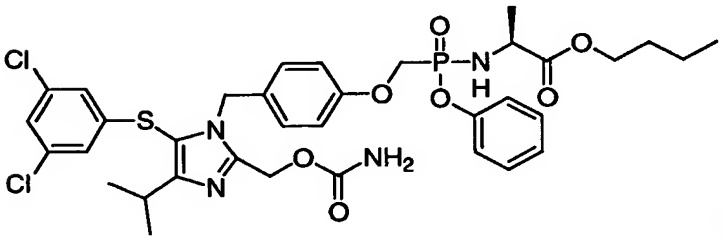
85



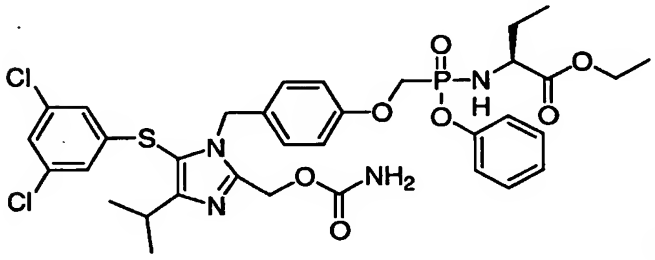
86



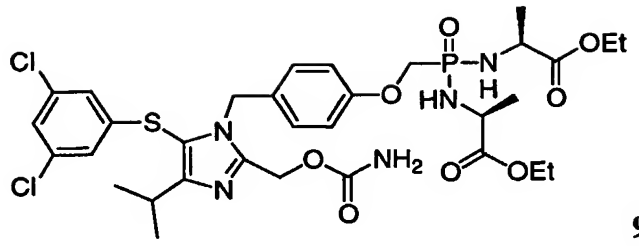
87



88

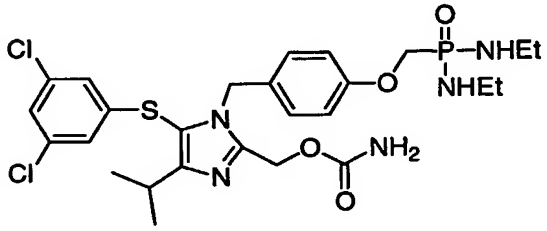


89



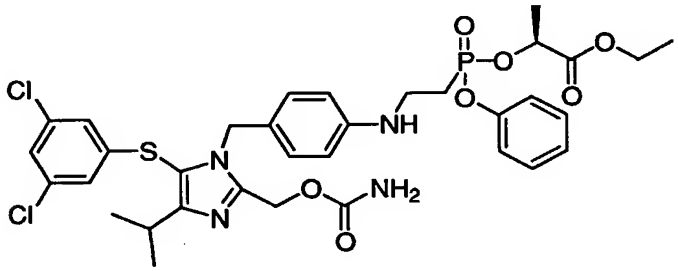
90

and

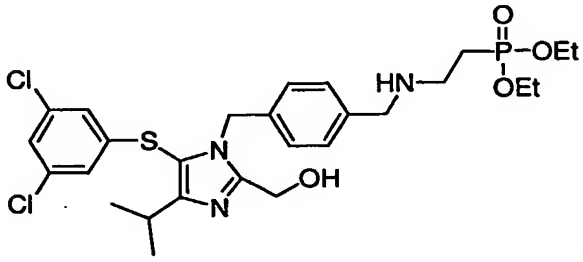


91 .

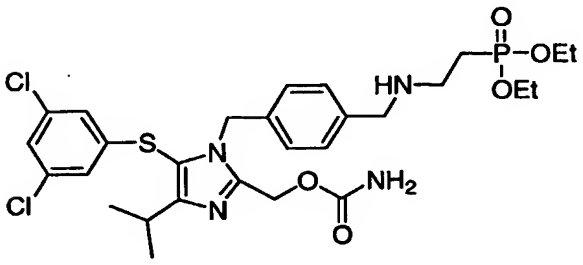
138. A compound of claim 5 selected from the structures:



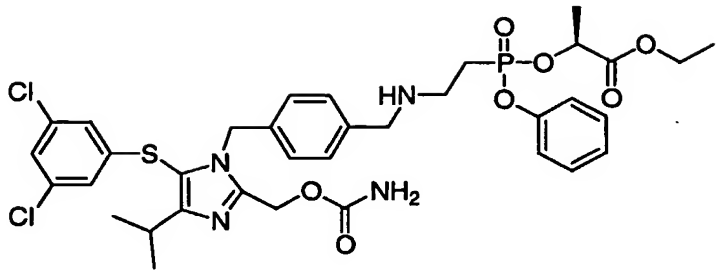
101



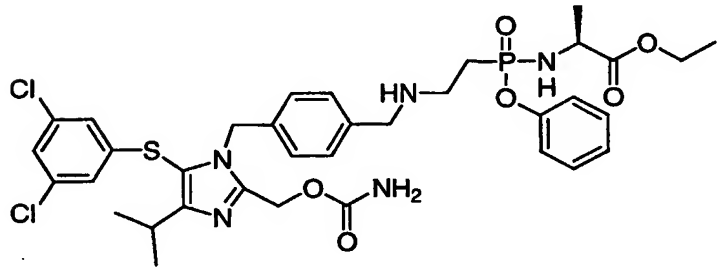
105



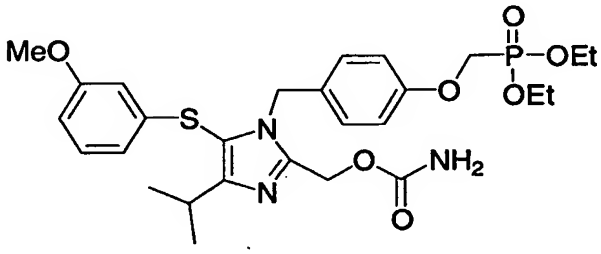
106



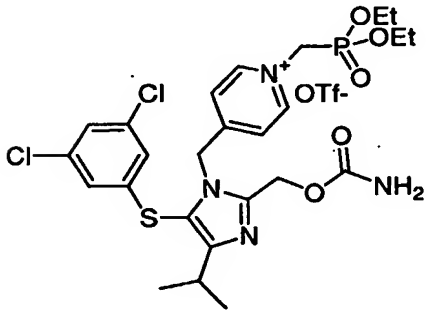
108



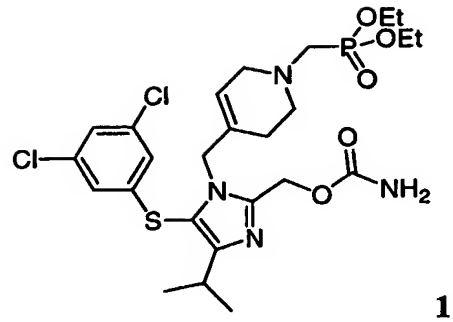
110



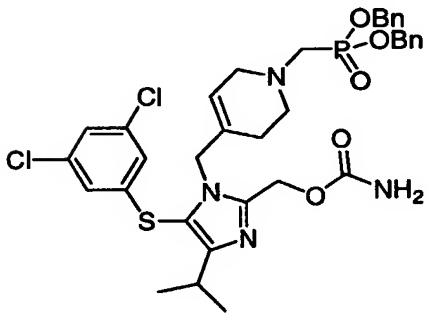
115



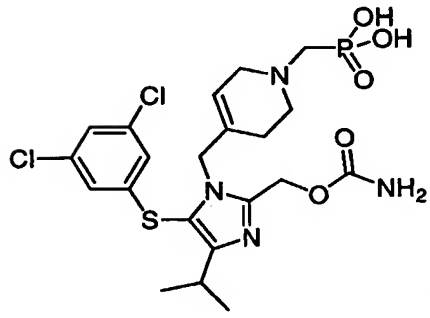
117



118

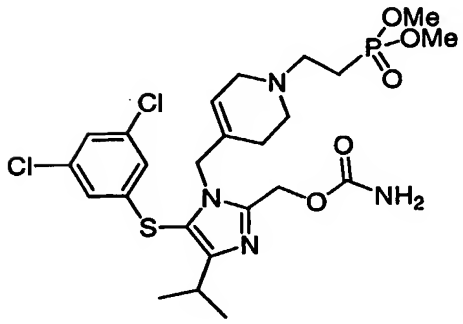


119



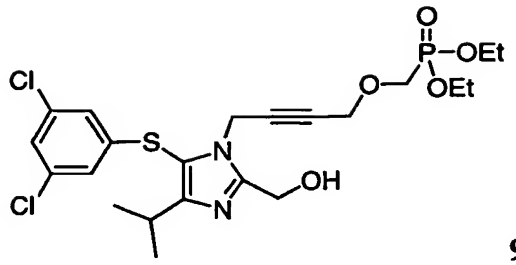
120

and

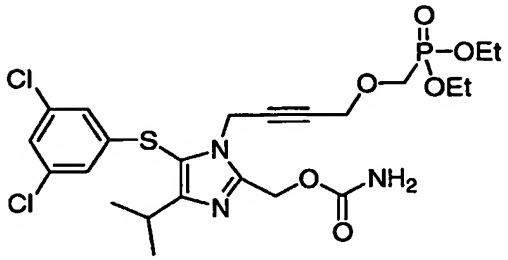


121

139. A compound of claim 3 selected from the structures:

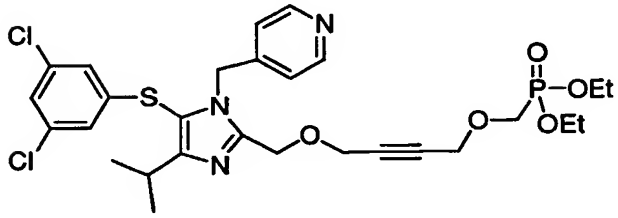


97



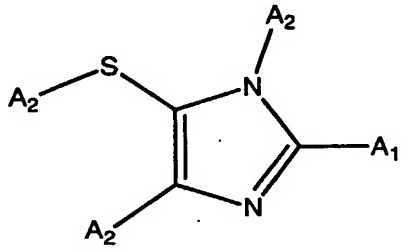
97a

and



122 .

140. A compound of the formula:



wherein:

$A_1$ is $-(X_2-(C(R_2)(R_2))_{m1}-X_3)_{m1}-W_3$, wherein $W_3$ is substituted with 1 to 3 $A_3$ groups;

$A_2$ is $-(X_2-(C(R_2)(R_2))_{m1}-X_3)_{m1}-W_3$;

$A_3$ is $-(X_2-(C(R_2)(R_2))_{m1}-X_3)_{m1}-P(Y_1)(Y_1R_{6a})(Y_1R_{6a})$;

$X_2$ and $X_3$ are independently a bond, -O-, $-N(R_2)-$, $-N(OR_2)-$, $-N(N(R_2)(R_2))-$, -S-, -SO-, or -SO2-;

each $Y_1$ is independently O, $N(R_2)$, $N(OR_2)$, or $N(N(R_2)(R_2))$, wherein each $Y_1$ is bound by two single bonds or one double bond;

$R_1$ is independently H or alkyl of 1 to 12 carbon atoms;

$R_2$ is independently H, $R_3$ or $R_4$ wherein each $R_4$ is independently substituted with 0 to 3 $R_3$ groups;

$R_3$ is independently F, Cl, Br, I, -CN, $N_3$, $-NO_2$, $-OR_{6a}$, $-OR_1$, $-N(R_1)_2$, $-N(R_1)(R_{6b})$, $-N(R_{6b})_2$, $-SR_1$, $-SR_{6a}$, $-S(O)R_1$, $-S(O)_2R_1$, $-S(O)OR_1$, $-S(O)OR_{6a}$, $-S(O)_2OR_1$, $-S(O)_2OR_{6a}$, $-C(O)OR_1$, $-C(O)R_{6c}$, $-C(O)OR_{6a}$, $-OC(O)R_1$, $-N(R_1)(C(O)R_1)$, $-N(R_{6b})(C(O)R_1)$, $-N(R_1)(C(O)OR_1)$, $-N(R_{6b})(C(O)OR_1)$, $-C(O)N(R_1)_2$, $-C(O)N(R_{6b})(R_1)$, $-C(O)N(R_{6b})_2$, $-C(NR_1)(N(R_1)_2)$, $-C(N(R_{6b}))(N(R_1)_2)$, $-C(N(R_1))(N(R_1)(R_{6b}))$, $-C(N(R_{6b}))(N(R_1)(R_{6b}))$, $-C(N(R_1))(N(R_{6b})_2)$, $-C(N(R_{6b}))(N(R_{6b})_2)$, $-N(R_1)C(N(R_1))(N(R_1)_2)$, $-N(R_1)C(N(R_1))(N(R_1)(R_{6b}))$, $-N(R_1)C(N(R_{6b}))(N(R_1)_2)$, $-N(R_{6b})C(N(R_1))(N(R_1)_2)$, $-N(R_{6b})C(N(R_{6b}))(N(R_1)_2)$, $-N(R_{6b})C(N(R_1))(N(R_1)(R_{6b}))$, $-N(R_1)C(N(R_{6b}))(N(R_1)(R_{6b}))$, $-N(R_1)C(N(R_1))(N(R_{6b})_2)$, $-N(R_{6b})C(N(R_{6b}))(N(R_1)(R_{6b}))$, $-N(R_{6b})C(N(R_1))(N(R_{6b})_2)$, $-N(R_1)C(N(R_{6b}))(N(R_{6b})_2)$, $-N(R_{6b})C(N(R_{6b}))(N(R_{6b})_2)$, =O, =S, $=N(R_1)$, $=N(R_{6b})$ or $W_5$;

$R_4$ is independently alkyl of 1 to 12 carbon atoms, alkenyl of 2 to 12 carbon atoms, or alkynyl of 2 to 12 carbon atoms;

$R_5$ is independently $R_4$ wherein each $R_4$ is substituted with 0 to 3 $R_3$ groups;

$R_{5a}$ is independently alkylene of 1 to 12 carbon atoms, alkenylene of 2 to 12 carbon atoms, or alkynylene of 2-12 carbon atoms any one of which alkylene, alkenylene or alkynylene is substituted with 0-3 $R_3$ groups;

$R_{6a}$ is independently H or an ether- or ester-forming group;

$R_{6b}$ is independently H, a protecting group for amino or the residue of a carboxyl-containing compound;

$R_{6c}$ is independently H or the residue of an amino-containing compound;

$W_3$ is $W_4$ or $W_5$;

$W_4$ is $R_5$, $-C(Y_1)R_5$, $-C(Y_1)W_5$, $-SO_2R_5$, or $-SO_2W_5$;

$W_5$ is carbocycle or heterocycle wherein $W_5$ is independently substituted with 0 to 3 $R_2$ groups;

m1 is independently an integer from 0 to 12, wherein the sum of all m1's within each individual claim of $A_1$, $A_2$ or $A_3$ is 12 or less; and

m2 is independently an integer from 0 to 2.

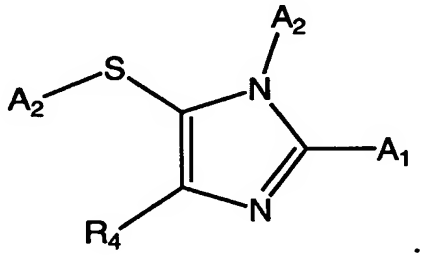
141. The compound of claim 140 wherein:

$A_1$ is $-(C(R_2)(R_2))_{m1}-W_3$, wherein $W_3$ is substituted with 1 $A_3$ group;

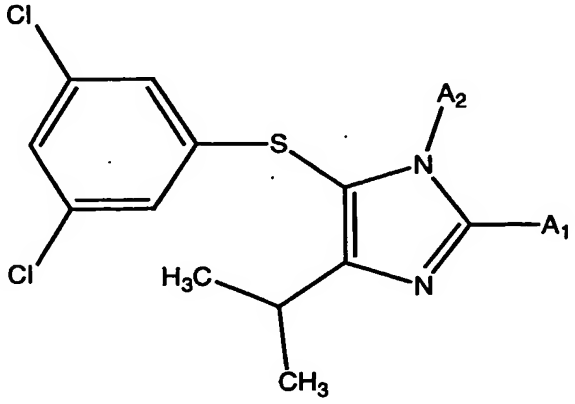
$A_2$ is $-(C(R_2)(R_2))_{m1}-W_3$; and

$A_3$ is $-(C(R_2)(R_2))_{m1}-P(Y_1)(Y_1R_{6a})(Y_1R_{6a})$.

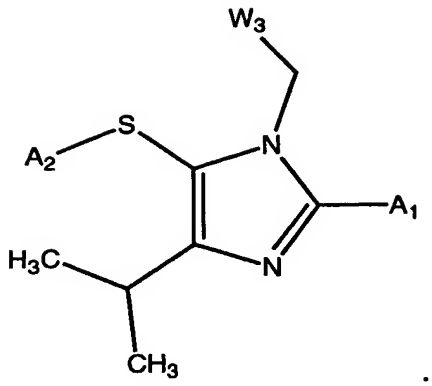
142. The compound of claim 141 having the formula:



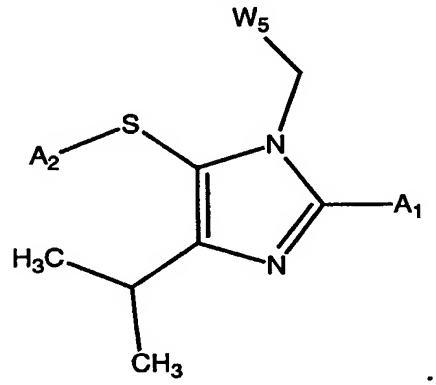

143. The compound of claim 142 having the formula:



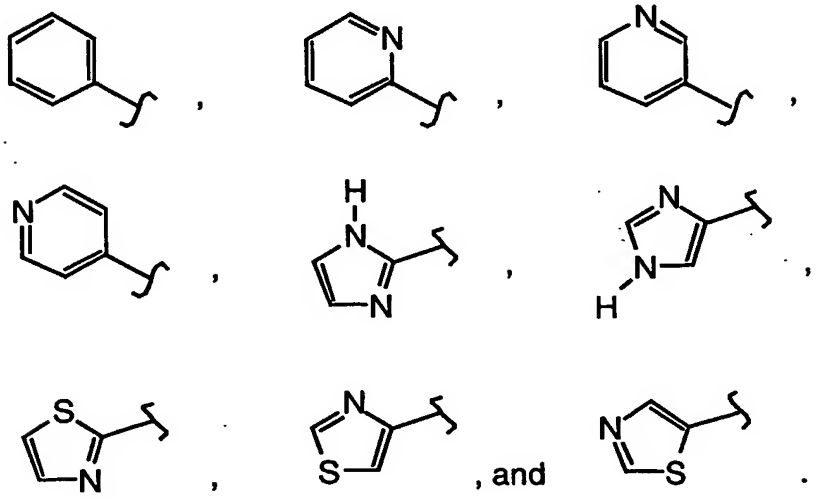

144. The compound of claim 143 having the formula:



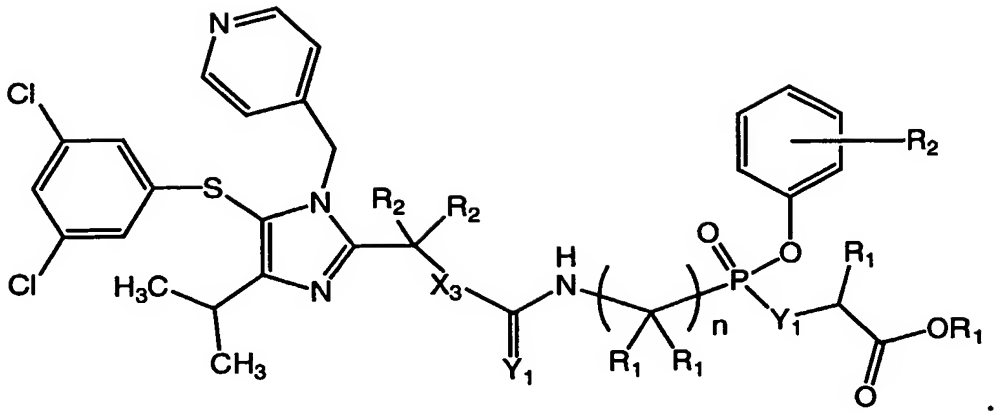
145. The compound of claim 144 having the formula:



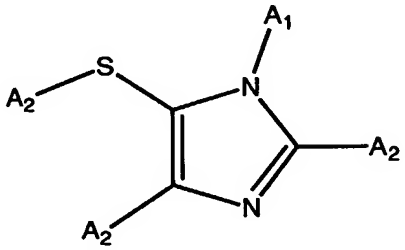
146. The compound of claim 145 wherein $W^5$ is selected from:



147. A compound of claim 140 having the formula:



148. A compound of the formula:



wherein:

$A_1$ is $-(X_2-(C(R_2)(R_2))_{m1}-X_3)_{m1}-W_3$, wherein $W_3$ is substituted with 1 to 3 $A_3$ groups;

$A_2$ is $-(X_2-(C(R_2)(R_2))_{m1}-X_3)_{m1}-W_3$;

$A_3$ is $-(X_2-(C(R_2)(R_2))_{m1}-X_3)_{m1}-P(Y_1)(Y_1R_{6a})(Y_1R_{6a})$;

$X_2$ and $X_3$ are independently a bond, -O-, $-N(R_2)-$, $-N(OR_2)-$, $-N(N(R_2)(R_2))-$, -S-, -SO-, or -SO2-;

each $Y_1$ is independently O, $N(R_2)$, $N(OR_2)$, or $N(N(R_2)(R_2))$, wherein each $Y_1$ is bound by two single bonds or one double bond;

$R_1$ is independently H or alkyl of 1 to 12 carbon atoms;

$R_2$ is independently H, $R_1$, $R_3$ or $R_4$ wherein each $R_4$ is independently substituted with 0 to 3 $R_3$ groups;

$R_3$ is independently F, Cl, Br, I, -CN, $N_3$, $-NO_2$, $-OR_{6a}$, $-OR_1$, $-N(R_1)_2$, $-N(R_1)(R_{6b})$, $-N(R_{6b})_2$, $-SR_1$, $-SR_{6a}$, $-S(O)R_1$, $-S(O)_2R_1$, $-S(O)OR_1$, $-S(O)OR_{6a}$, $-S(O)_2OR_1$, $-S(O)_2OR_{6a}$, $-C(O)OR_1$, $-C(O)R_{6c}$, $-C(O)OR_{6a}$, $-OC(O)R_1$, $-N(R_1)(C(O)R_1)$, $-N(R_{6b})(C(O)R_1)$, $-N(R_1)(C(O)OR_1)$, $-N(R_{6b})(C(O)OR_1)$, $-C(O)N(R_1)_2$,

-C(O)N($R_{6b}$)($R_1$), -C(O)N($R_{6b}$)2, -C(N$R_1$)(N($R_1$)2), -C(N($R_{6b}$))(N($R_1$)2), -C(N($R_1$))(N($R_1$)($R_{6b}$)), -C(N($R_{6b}$))(N($R_1$)($R_{6b}$)), -C(N($R_1$))(N($R_{6b}$)2), -C(N($R_{6b}$))(N($R_{6b}$)2), -N($R_1$)C(N($R_1$))(N($R_1$)2), -N($R_1$)C(N($R_1$))(N($R_1$)($R_{6b}$)), -N($R_1$)C(N($R_{6b}$))(N($R_1$)2), -N($R_{6b}$)C(N($R_1$))(N($R_1$)2), -N($R_{6b}$)C(N($R_{6b}$))(N($R_1$)2), -N($R_{6b}$)C(N($R_1$))(N($R_1$)($R_{6b}$)), -N($R_1$)C(N($R_{6b}$))(N($R_1$)($R_{6b}$)), -N($R_1$)C(N($R_1$))(N($R_{6b}$)2), -N($R_{6b}$)C(N($R_{6b}$))(N($R_1$)($R_{6b}$)), -N($R_{6b}$)C(N($R_1$))(N($R_{6b}$)2), -N($R_1$)C(N($R_{6b}$))(N($R_{6b}$)2), -N($R_{6b}$)C(N($R_{6b}$))(N($R_{6b}$)2), =O, =S, =N($R_1$), =N($R_{6b}$) or $W_5$;

$R_4$ is independently alkyl of 1 to 12 carbon atoms, alkenyl of 2 to 12 carbon atoms, or alkynyl of 2 to 12 carbon atoms;

$R_5$ is independently $R_4$ wherein each $R_4$ is substituted with 0 to 3 $R_3$ groups;

$R_{5a}$ is independently alkylene of 1 to 12 carbon atoms, alkenylene of 2 to 12 carbon atoms, or alkynylene of 2-12 carbon atoms any one of which alkylene, alkenylene or alkynylene is substituted with 0-3 $R_3$ groups;

$R_{6a}$ is independently H or an ether- or ester-forming group;

$R_{6b}$ is independently H, a protecting group for amino or the residue of a carboxyl-containing compound;

$R_{6c}$ is independently H or the residue of an amino-containing compound;

$W_3$ is $W_4$ or $W_5$;

$W_4$ is $R_5$, -C($Y_1$)$R_5$, -C($Y_1$)$W_5$, -$SO_2R_5$, or -$SO_2W_5$;

$W_5$ is carbocycle or heterocycle wherein $W_5$ is independently substituted with 0 to 3 $R_2$ groups;

m1 is independently an integer from 0 to 12, wherein the sum of all m1's within each individual claim of $A_1$, $A_2$ or $A_3$ is 12 or less; and

m2 is independently an integer from 0 to 2.

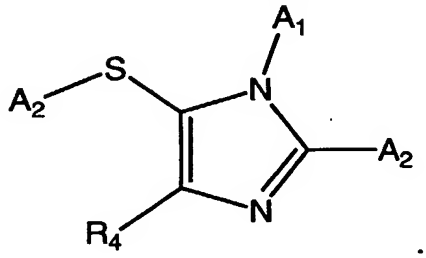
149. The compound of claim 148 wherein:

$A_1$ is -(C($R_2$)($R_2$))$_{m1}$-$W_3$, wherein $W_3$ is substituted with 1 $A_3$ group;

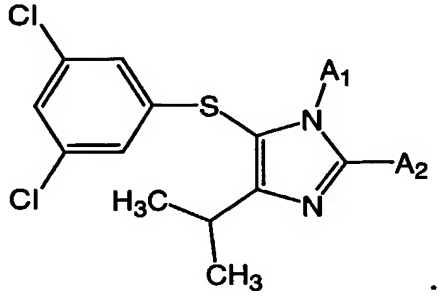
$A_2$ is -(C($R_2$)($R_2$))$_{m1}$-$W_3$; and

$A_3$ is -(C($R_2$)($R_2$))$_{m1}$-P($Y_1$)($Y_1R_{6a}$)($Y_1R_{6a}$).

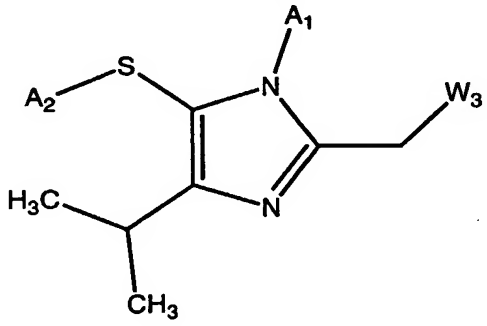
150. The compound of claim 148 having the formula:



151. The compound of claim 148 having the formula:

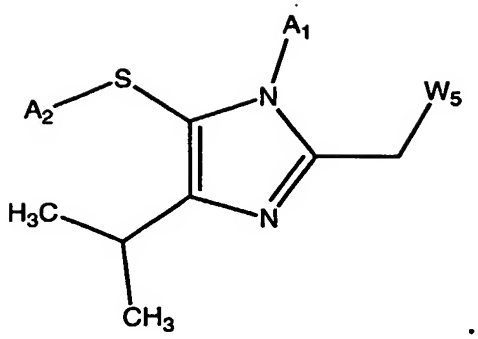


152. The compound of claim 151 having the formula:

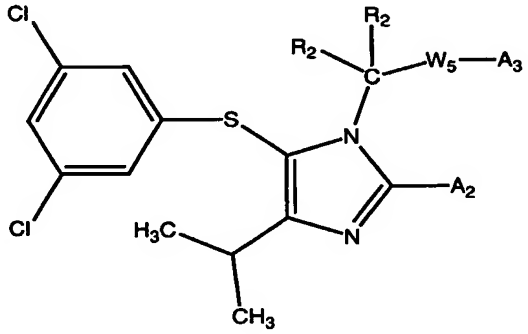


153. The compound of claim 152 wherein $W_3$ is $-OC(O)NH_2$.

154. The compound of claim 152 having the formula:

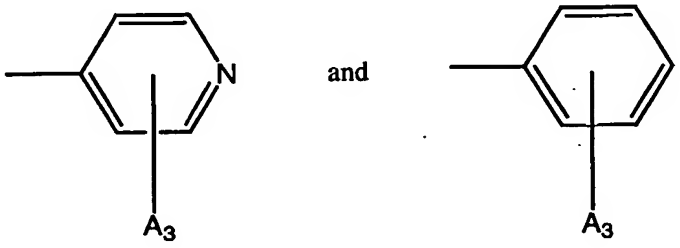


155. The compound of claim 151 having the formula:

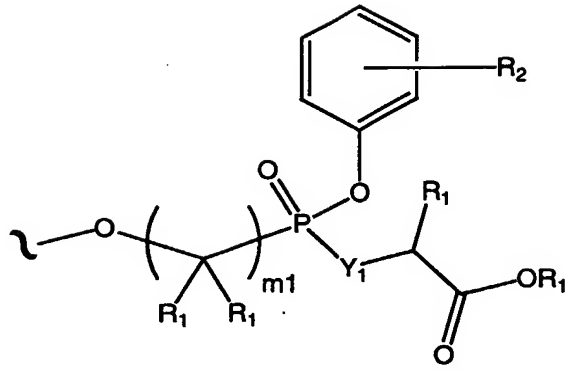


156. The compound of claim 155 wherein $W_5$ is a pyridine heterocycle bonded to $-C(R_2)_2-$ at the 2, 3, 4, 5 or 6 position.

157. The compound of claim 155 wherein $W_5-A_3$ has a formula selected from:

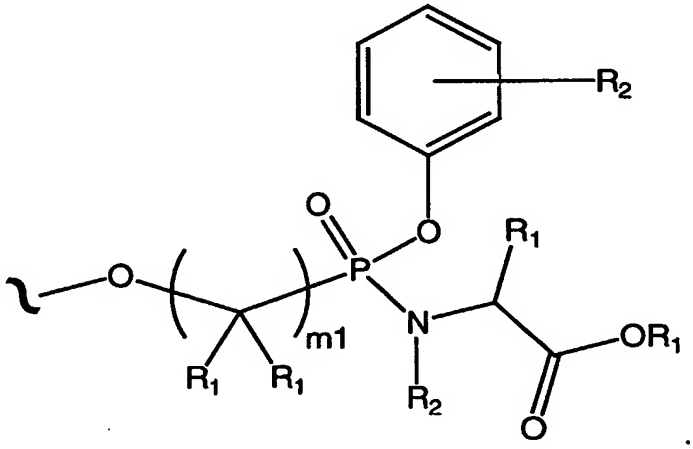


158. The compound of claim 155 wherein $A_3$ has a formula selected from:

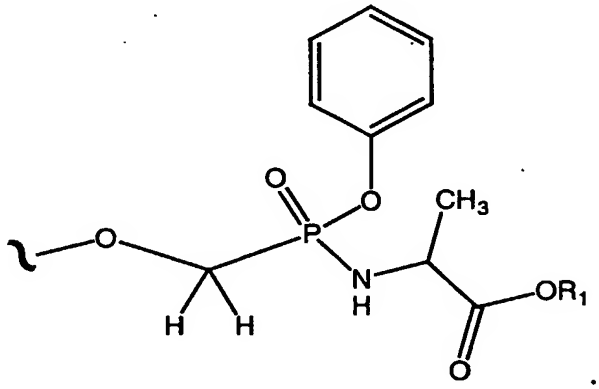


wherein m1 is 1, 2, 3, 4, 5, 6, 7 or 8, and the phenyl carbocycle is substituted with 0 to 3 $R_2$ groups.

159. The compound of claim 158 wherein $A_3$ has a formula selected from:



160. The compound of claim 159 wherein $A_3$ has a formula selected from:



161. A method of inhibiting the activity of HIV RT comprising the step of contacting

a sample suspected of containing HIV RT with a composition of claim 1.

162. The method of claim 161 wherein the HIV RT is *in vivo*.

163. A method for the treatment or prevention of the symptoms or effects of an HIV infection in an infected animal which comprises administering to said animal a formulation comprising a therapeutically effective amount of a compound according to claim 1.

164. The method of claim 163 wherein the compound is formulated with a pharmaceutically acceptable carrier.

165. A method of targetting white blood cells comprising administering to an HIV infected animal a formulation comprising a therapeutically effective amount of a compound according to claim 1 whereby the compound or metabolites derived from the compound accumulate in the white blood cells of the HIV infected animal.

166. The use of a compound of claim 1 to prepare a medicament for treatment of HIV infection.

167. The method of claim 163 wherein the formulation further comprises a second active ingredient selected from a protease inhibitor (Prt), a nucleoside reverse transcriptase inhibitor (NRTI), a non- nucleoside reverse transcriptase inhibitor (NNRTI), and an integrase inhibitor.

168. A process for preparing a compound of claim 1 wherein a compound comprising $A^3$ or a precursor to $A^3$ is reacted with an imidazole compound whereby a compound of claim 1 is formed.

169. A compound of the formula MBF.

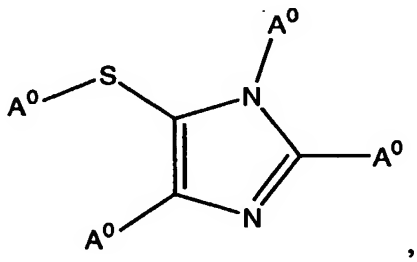
170. In a non-nucleotide reverse transcriptase inhibitor, the improvement comprising a substituent having a phosphonate or phosphonate prodrug.

171. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 170 selected from:

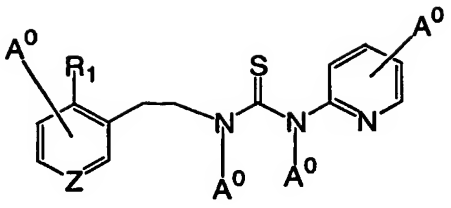
Capravirine-like phosphonate NNRTI compounds,
PETT-like phosphonate NNRTI compounds,
Pyrazole-like phosphonate NNRTI compounds,
Urea-PETT-like phosphonate NNRTI compounds,
Nevaripine-like phosphonate NNRTI compounds,
Quinazolinone-like phosphonate NNRTI compounds,
Efavirenz-like phosphonate NNRTI compounds,
Benzophenone-like phosphonate NNRTI compounds,
Pyrimidine-like phosphonate NNRTI compounds,
SJ3366-like phosphonate NNRTI compounds,
Delavirdine-like phosphonate NNRTI compounds,
Emivirine-like phosphonate NNRTI compounds,
Loviride-like phosphonate NNRTI compounds, and
UC781-like phosphonate NNRTI compounds;

and pharmaceutically acceptable salts, hydrates, and formulations thereof.

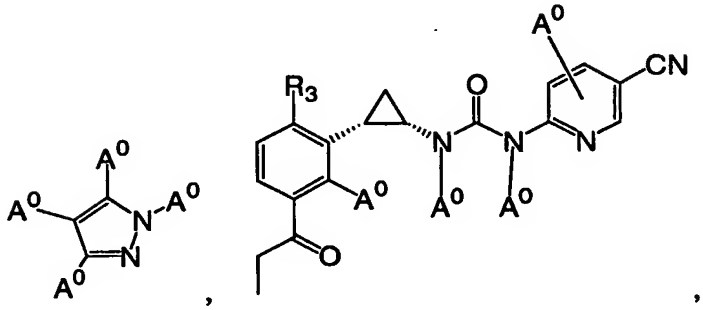
172. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 170 of the Formulas:

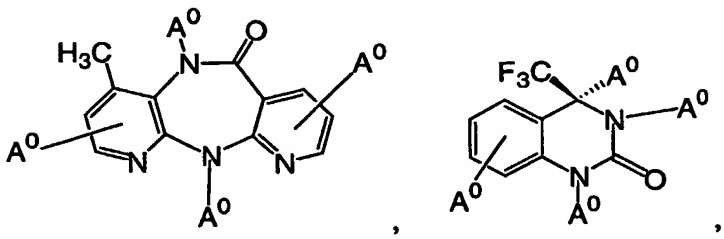


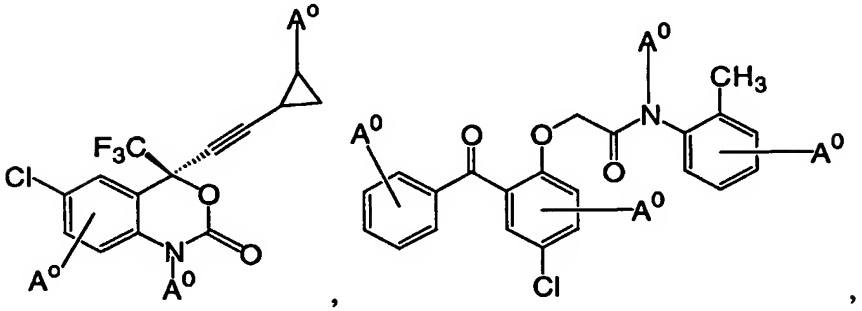

,

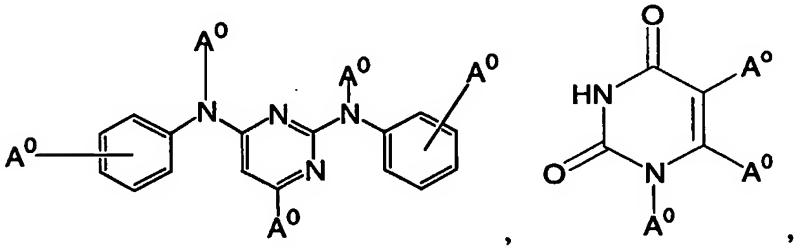


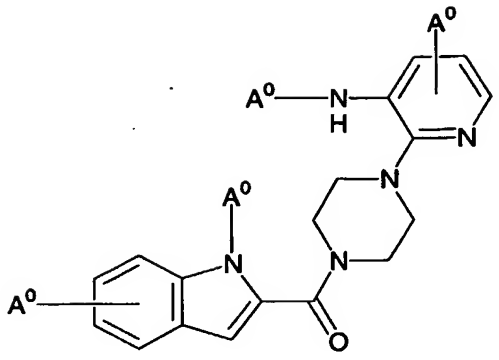
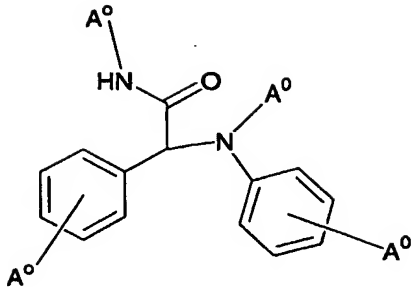
where Z is CH or N,

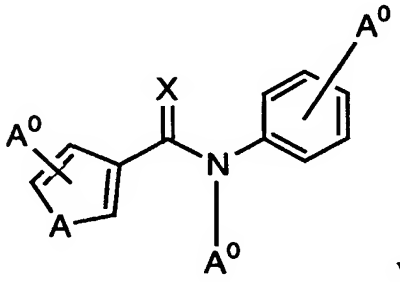










, and

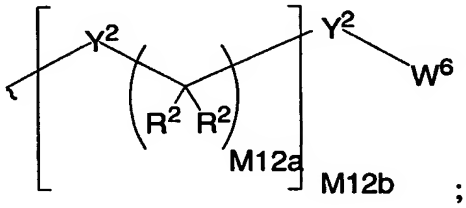


where A is O, S, or N($R^x$) and X is O or S;

wherein:

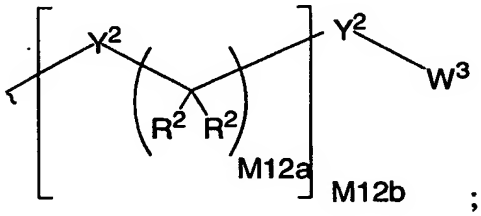
$A^0$ is $A^1$, $A^2$ or $W^3$ with the proviso that the compound includes at least one $A^1$;

$A^1$ is:



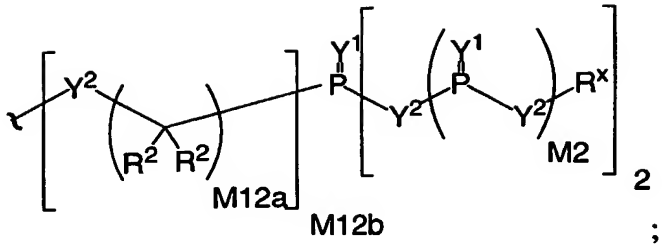
;

$A^2$ is:



;

$A^3$ is:

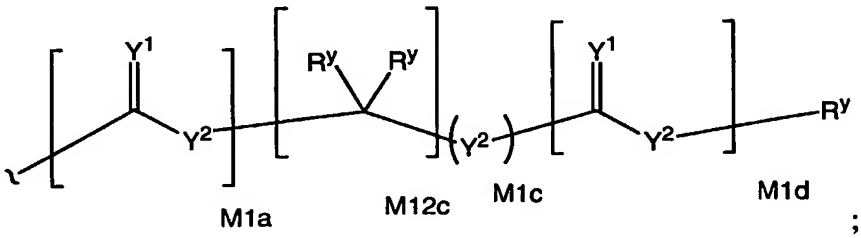



;

$Y^1$ is independently O, S, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, or $N(N(R^x)(R^x))$;

$Y^2$ is independently a bond, O, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, $N(N(R^x)(R^x))$, $-S(O)_{M2}-$, or $-S(O)_{M2}-S(O)_{M2}-$;

$R^x$ is independently H, $R^1$, $W^3$, a protecting group, or the formula:




;

$R^y$ is independently H, $W^3$, $R^2$ or a protecting group;

$R^1$ is independently H or an alkyl of 1 to 18 carbon atoms;

$R^2$ is independently H, $R^1$, $R^3$ or $R^4$ wherein each $R^4$ is independently substituted with 0 to 3 $R^3$ groups, or taken together at a carbon atom, two $R^2$ groups form a ring of 3 to 8 carbons and the ring may be substituted with 0 to 3 $R^3$ groups;

$R^3$ is $R^{3a}$, $R^{3b}$, $R^{3c}$ or $R^{3d}$, provided that when $R^3$ is bound to a heteroatom, then $R^3$ is $R^{3c}$ or $R^{3d}$;

$R^{3a}$ is F, Cl, Br, I, -CN, $N_3$ or $-NO_2$;

$R^{3b}$ is $Y^1$;

$R^{3c}$ is $-R^x$, $-N(R^x)(R^x)$, $-SR^x$, $-S(O)R^x$, $-S(O)_2R^x$, $-S(O)(OR^x)$, $-S(O)_2(OR^x)$, $-OC(Y^1)R^x$, $-OC(Y^1)OR^x$, $-OC(Y^1)(N(R^x)(R^x))$, $-SC(Y^1)R^x$, $-SC(Y^1)OR^x$, $-SC(Y^1)(N(R^x)(R^x))$, $-N(R^x)C(Y^1)R^x$, $-N(R^x)C(Y^1)OR^x$, or $-N(R^x)C(Y^1)(N(R^x)(R^x))$ ;

$R^{3d}$ is $-C(Y^1)R^x$, $-C(Y^1)OR^x$ or $-C(Y^1)(N(R^x)(R^x))$;

$R^4$ is an alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, or alkynyl of 2 to 18 carbon atoms;

$R^5$ is $R^4$ wherein each $R^4$ is substituted with 0 to 3 $R^3$ groups;

$W^3$ is $W^4$ or $W^5$;

$W^4$ is $R^5$, $-C(Y^1)R^5$, $-C(Y^1)W^5$, $-SO_2R^5$, or $-SO_2W^5$;

$W^5$ is carbocycle or heterocycle wherein $W^5$ is independently substituted with 0 to 3 $R^2$ groups;

$W^6$ is $W^3$ independently substituted with 1, 2, or 3 $A^3$ groups;

$W^7$ is a heterocycle bonded through a nitrogen atom of said heterocycle and independently substituted with 0, 1 or 2 $A^0$ groups;

M2 is 0, 1 or 2;

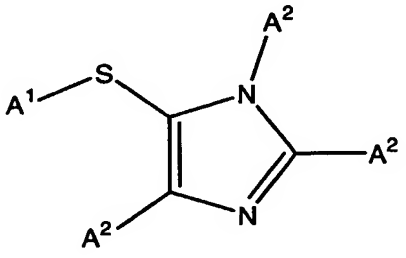
M12a is 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12;

M12b is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12;

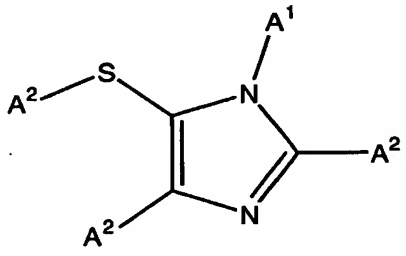
M1a, M1c, and M1d are independently 0 or 1; and

M12c is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

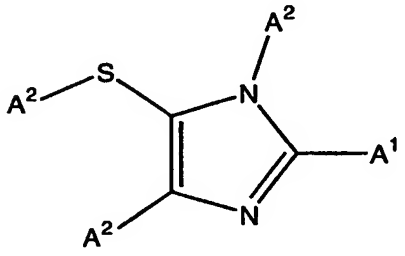
173. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:



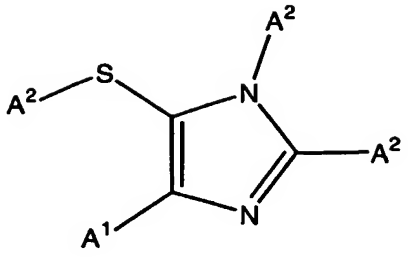

Ia




Ib

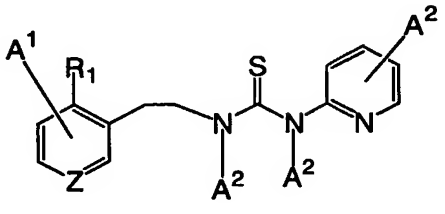


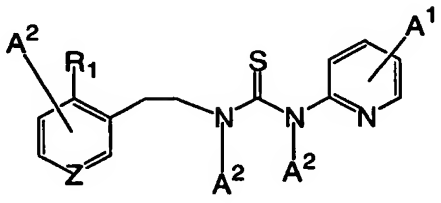

Ic and

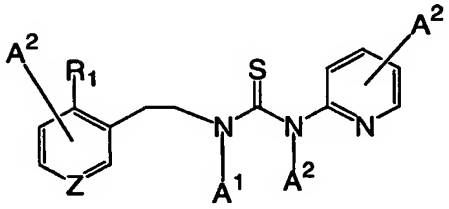


Id .

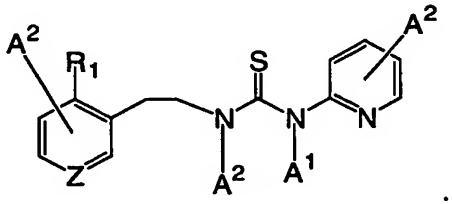
174. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:



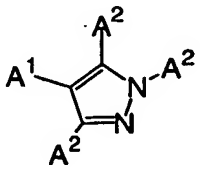


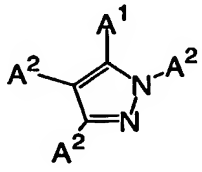


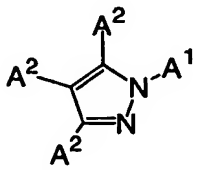
and



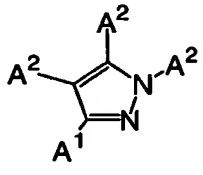
175. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:



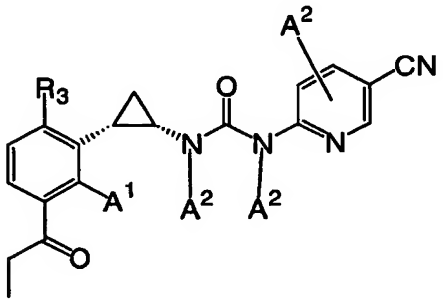
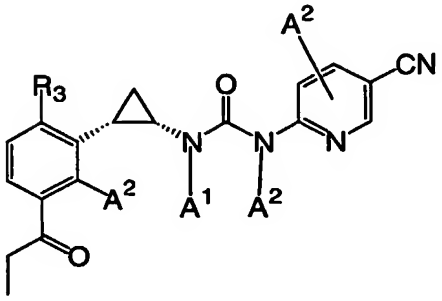
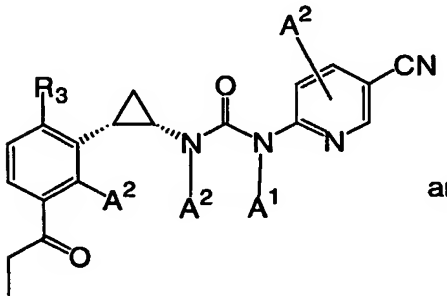
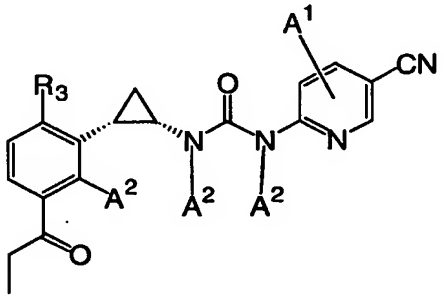




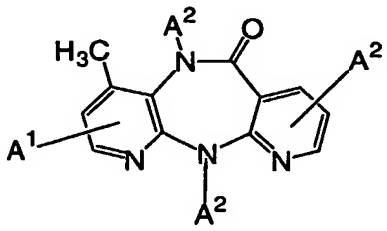
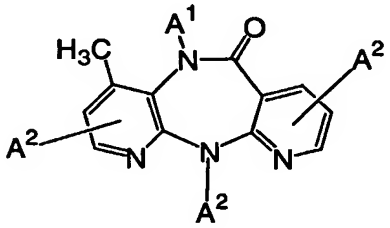
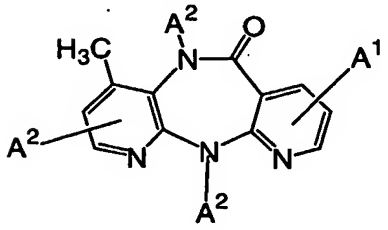
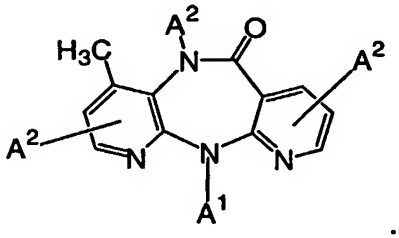
and



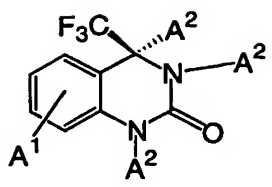
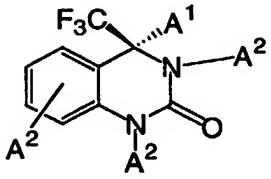
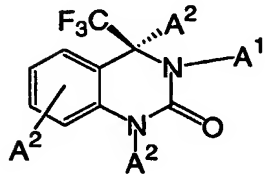
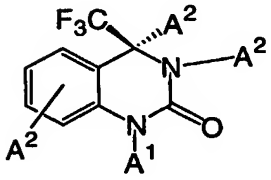
176. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:




and


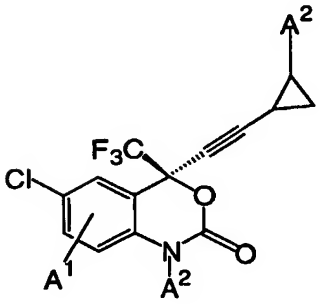
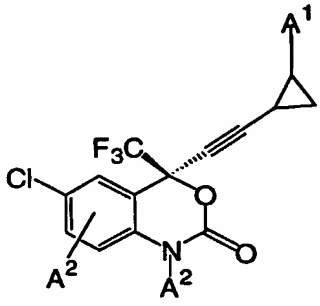
177. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:




and


178. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:




and


179. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas: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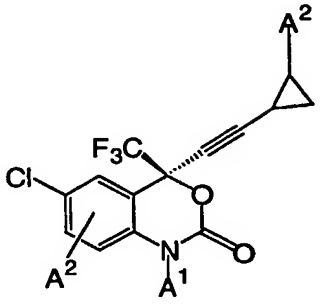
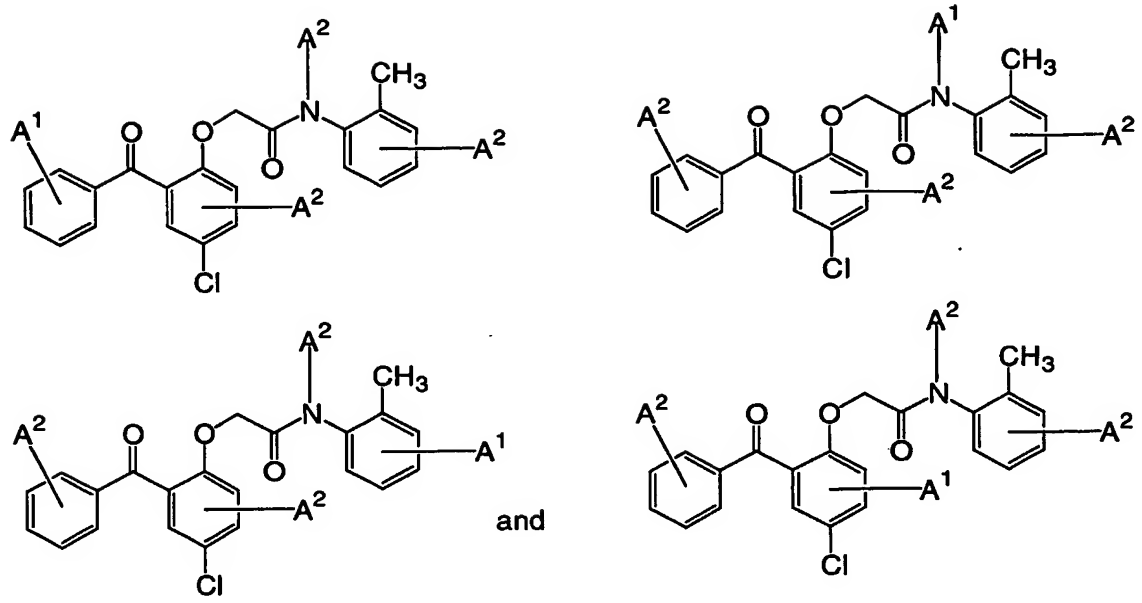
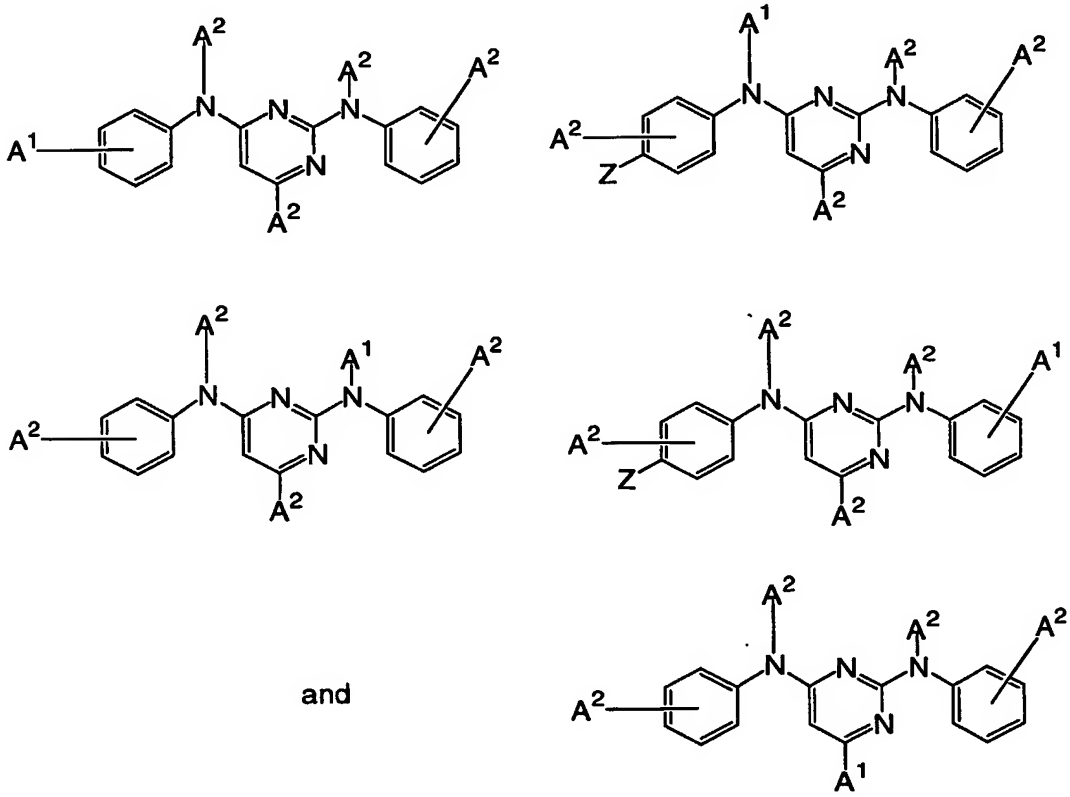


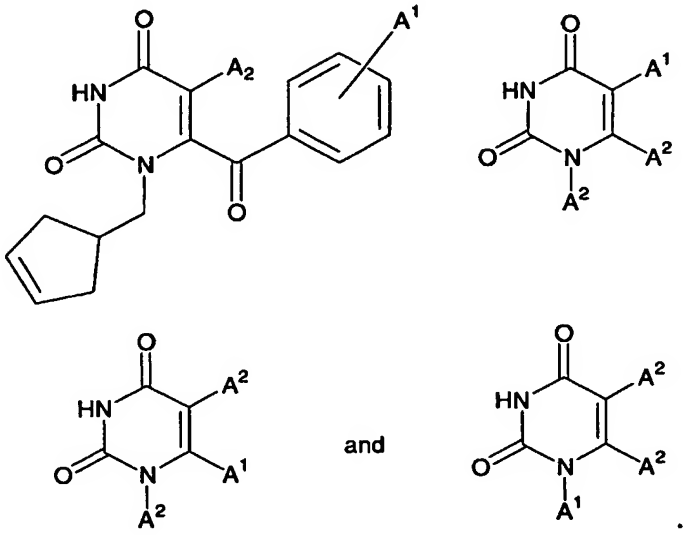
180. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:




181. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:

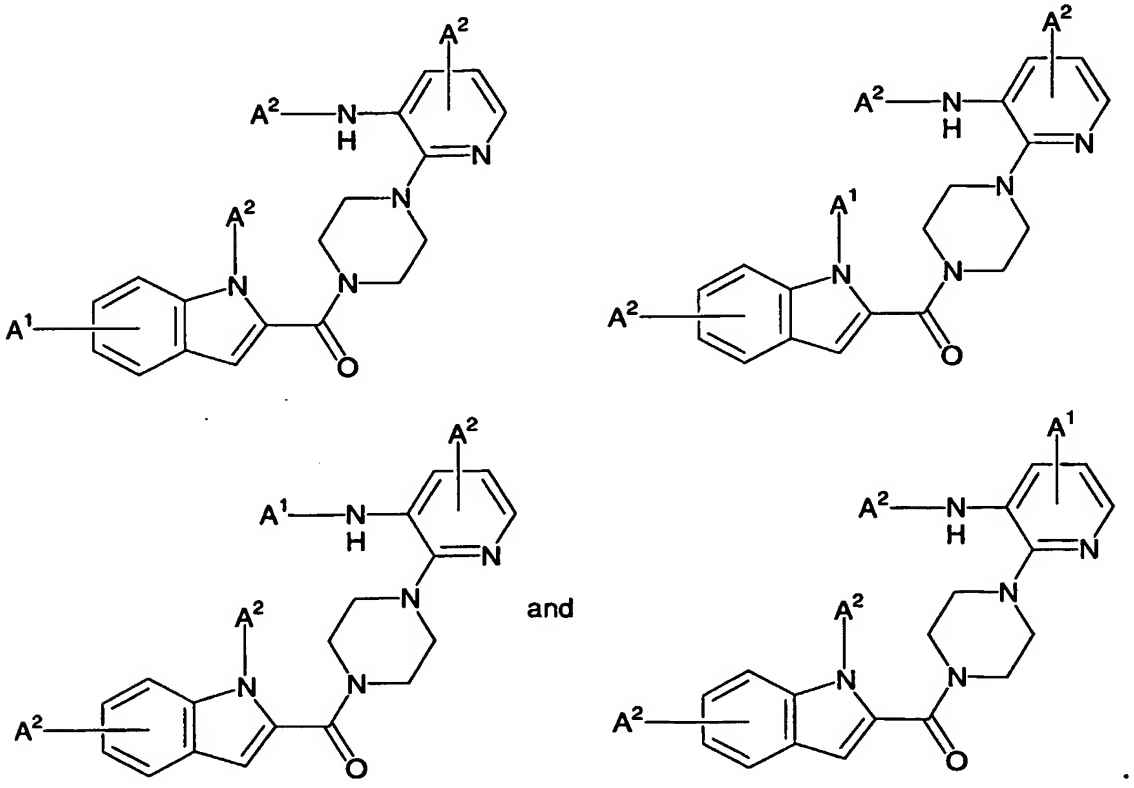


182. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:



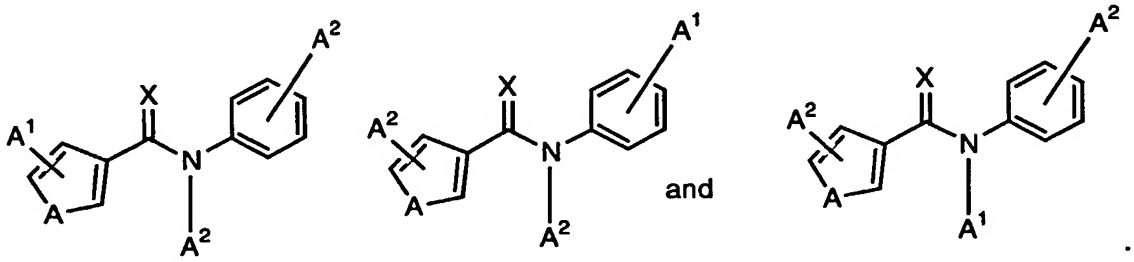
and

183. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:

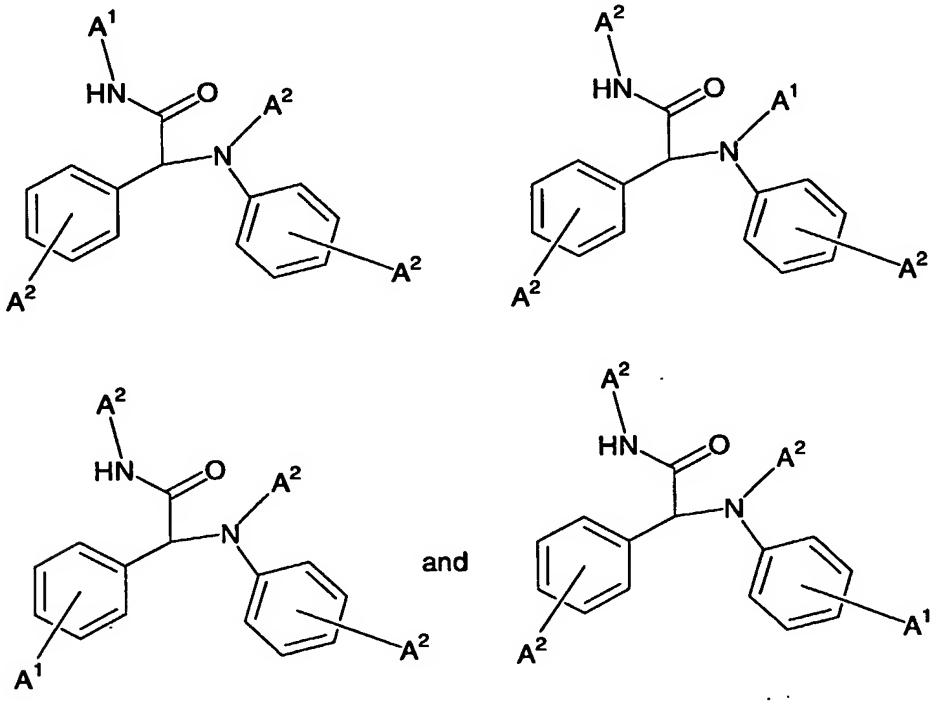


and

184. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:




185. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 172 of the Formulas:




186. In a non-nucleotide reverse transcriptase inhibitor not containing a phosphonate or phosphonate prodrug, the improvement comprising a substituent having a phosphonate or phosphonate prodrug.

187. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 186 selected from:

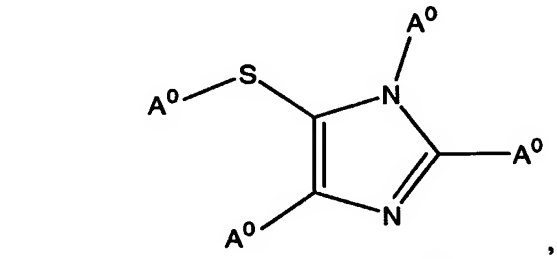
Capravirine-like phosphonate NNRTI compounds,

PETT-like phosphonate NNRTI compounds,

Pyrazole-like phosphonate NNRTI compounds,
Urea-PETT-like phosphonate NNRTI compounds,
Nevaripine-like phosphonate NNRTI compounds,
Quinazolinone-like phosphonate NNRTI compounds,
Efavirenz-like phosphonate NNRTI compounds,
Benzophenone-like phosphonate NNRTI compounds,
Pyrimidine-like phosphonate NNRTI compounds,
SJ3366-like phosphonate NNRTI compounds,
Delavirdine-like phosphonate NNRTI compounds,
Emivirine-like phosphonate NNRTI compounds,
Loviride-like phosphonate NNRTI compounds, and
UC781-like phosphonate NNRTI compounds;

and pharmaceutically acceptable salts, hydrates, and formulations thereof.

188. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 186 of the Formulas:



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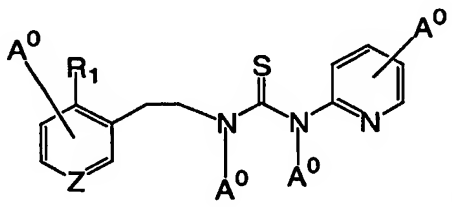
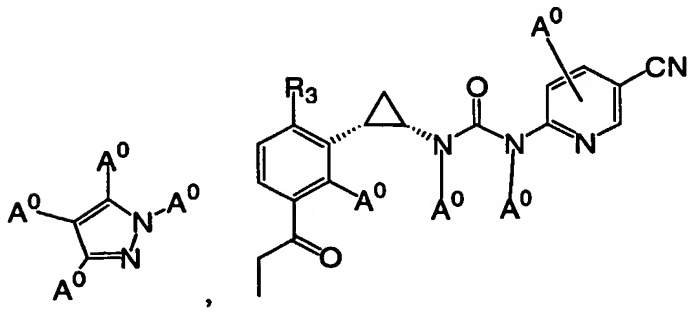


where Z is CH or N,



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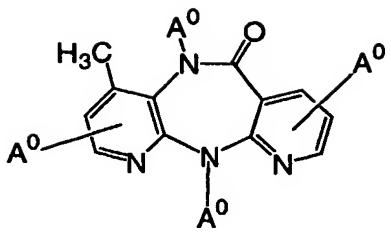
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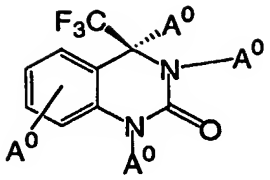
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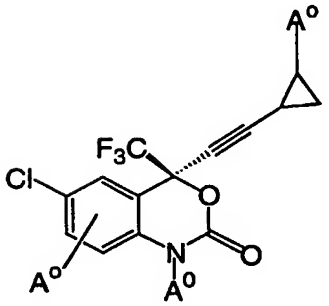
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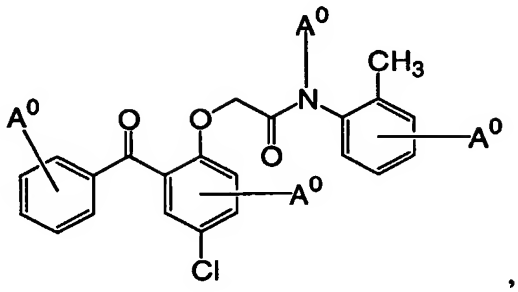
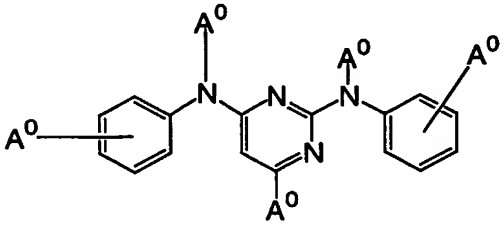

,

5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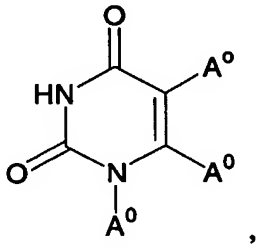
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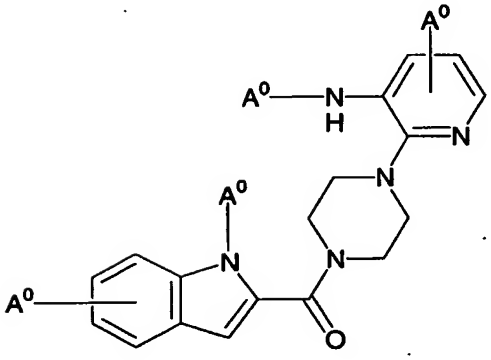
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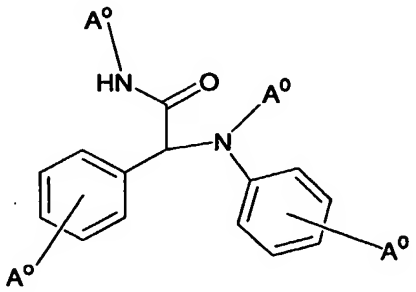
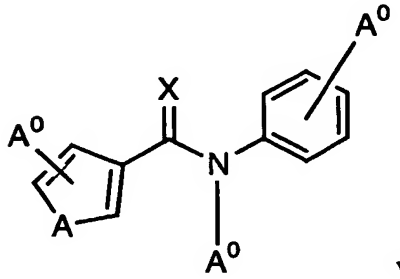

, and

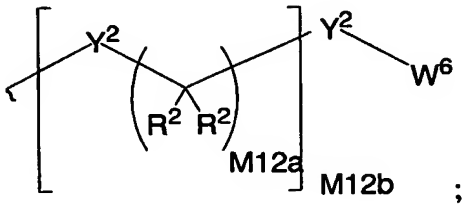


10 where A is O, S, or N($R^x$) and X is O or S;

wherein:

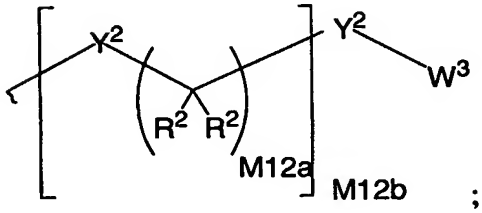
$A^0$ is $A^1$, $A^2$ or $W^3$ with the proviso that the compound includes at least one $A^1$;

$A^1$ is:



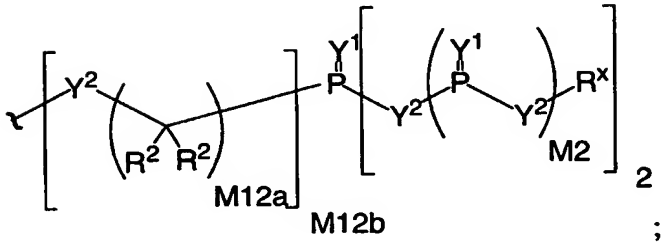

;

$A^2$ is:




;

$A^3$ is:

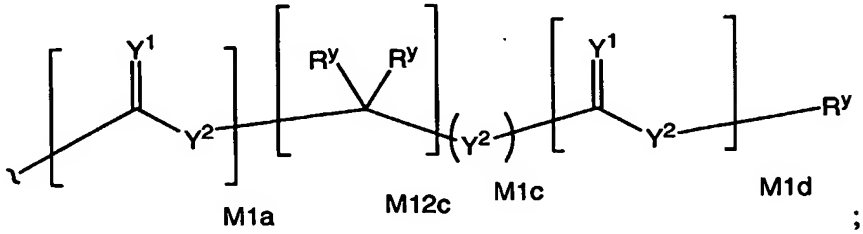



;

$Y^1$ is independently O, S, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, or $N(N(R^x)(R^x))$;

$Y^2$ is independently a bond, O, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, $N(N(R^x)(R^x))$, $-S(O)_{M2}-$, or $-S(O)_{M2}-S(O)_{M2}-$;

$R^x$ is independently H, $R^1$, $W^3$, a protecting group, or the formula:




;

$R^y$ is independently H, $W^3$, $R^2$ or a protecting group;

$R^1$ is independently H or an alkyl of 1 to 18 carbon atoms;

$R^2$ is independently H, $R^1$, $R^3$ or $R^4$ wherein each $R^4$ is independently substituted with 0 to 3 $R^3$ groups, or taken together at a carbon atom, two $R^2$ groups form a ring of 3 to 8 carbons and the ring may be substituted with 0 to 3 $R^3$ groups;

$R^3$ is $R^{3a}$, $R^{3b}$, $R^{3c}$ or $R^{3d}$, provided that when $R^3$ is bound to a heteroatom, then $R^3$ is $R^{3c}$ or $R^{3d}$;

$R^{3a}$ is F, Cl, Br, I, -CN, $N_3$ or $-NO_2$;

$R^{3b}$ is $Y^1$;

$R^{3c}$ is $-R^x$, $-N(R^x)(R^x)$, $-SR^x$, $-S(O)R^x$, $-S(O)_2R^x$, $-S(O)(OR^x)$, $-S(O)_2(OR^x)$, $-OC(Y^1)R^x$, $-OC(Y^1)OR^x$, $-OC(Y^1)(N(R^x)(R^x))$, $-SC(Y^1)R^x$, $-SC(Y^1)OR^x$, $-SC(Y^1)(N(R^x)(R^x))$, $-N(R^x)C(Y^1)R^x$, $-N(R^x)C(Y^1)OR^x$, or $-N(R^x)C(Y^1)(N(R^x)(R^x))$ ;

$R^{3d}$ is $-C(Y^1)R^x$, $-C(Y^1)OR^x$ or $-C(Y^1)(N(R^x)(R^x))$;

$R^4$ is an alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, or alkynyl of 2 to 18 carbon atoms;

$R^5$ is $R^4$ wherein each $R^4$ is substituted with 0 to 3 $R^3$ groups;

$W^3$ is $W^4$ or $W^5$;

$W^4$ is $R^5$, $-C(Y^1)R^5$, $-C(Y^1)W^5$, $-SO_2R^5$, or $-SO_2W^5$;

$W^5$ is carbocycle or heterocycle wherein $W^5$ is independently substituted with 0 to 3 $R^2$ groups;

$W^6$ is $W^3$ independently substituted with 1, 2, or 3 $A^3$ groups;

$W^7$ is a heterocycle bonded through a nitrogen atom of said heterocycle and independently substituted with 0, 1 or 2 $A^0$ groups;

M2 is 0, 1 or 2;

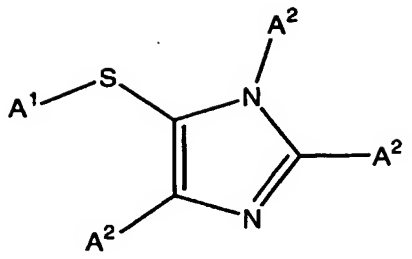
M12a is 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12;

M12b is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12;

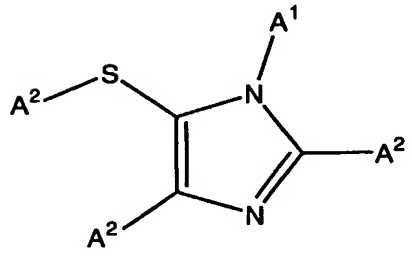
M1a, M1c, and M1d are independently 0 or 1; and

M12c is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

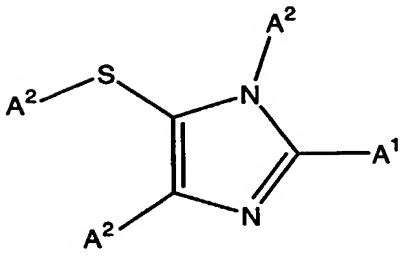
189. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



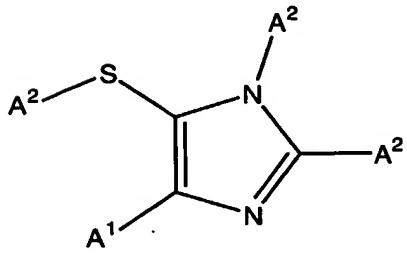
Ia



Ib

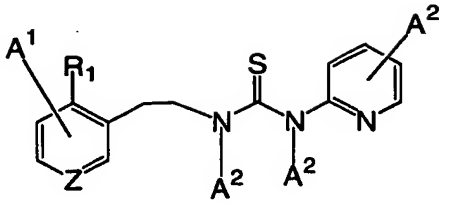
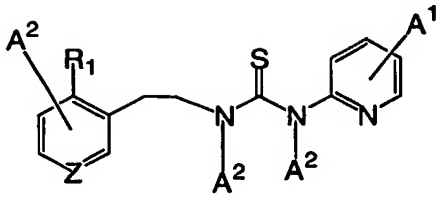
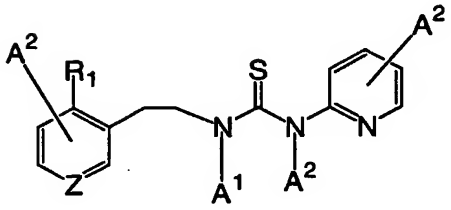
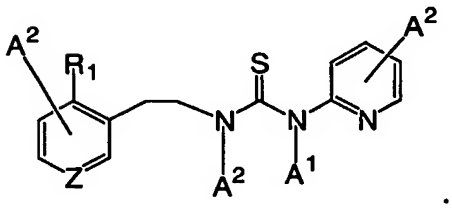


Ic and

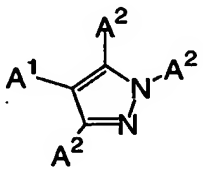
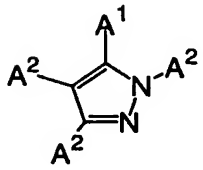
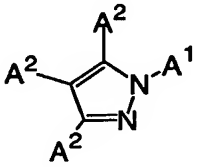
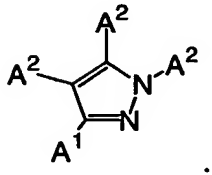


Id .

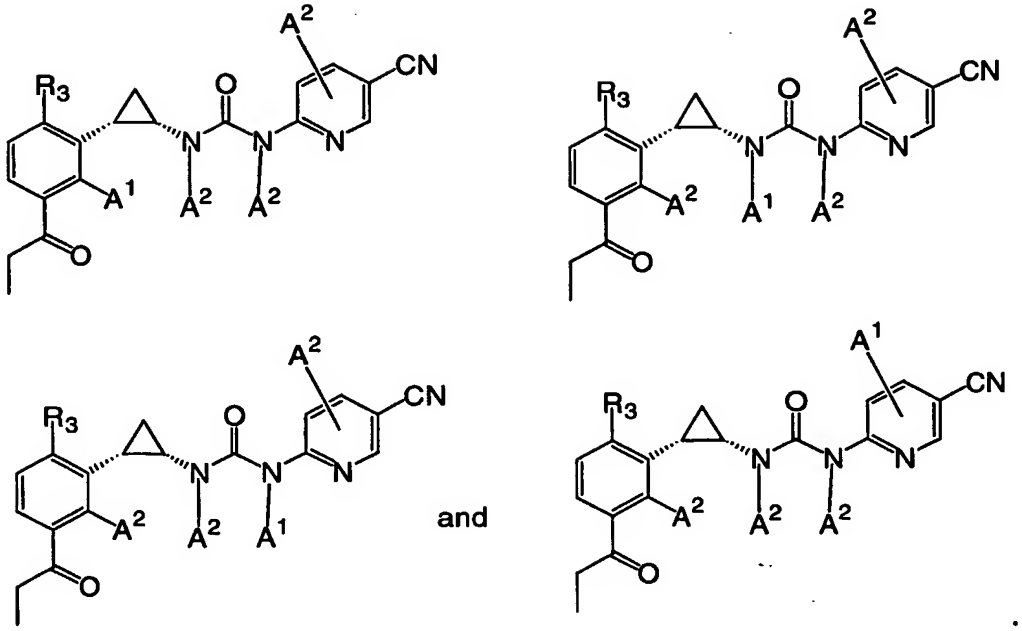
190. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:




and


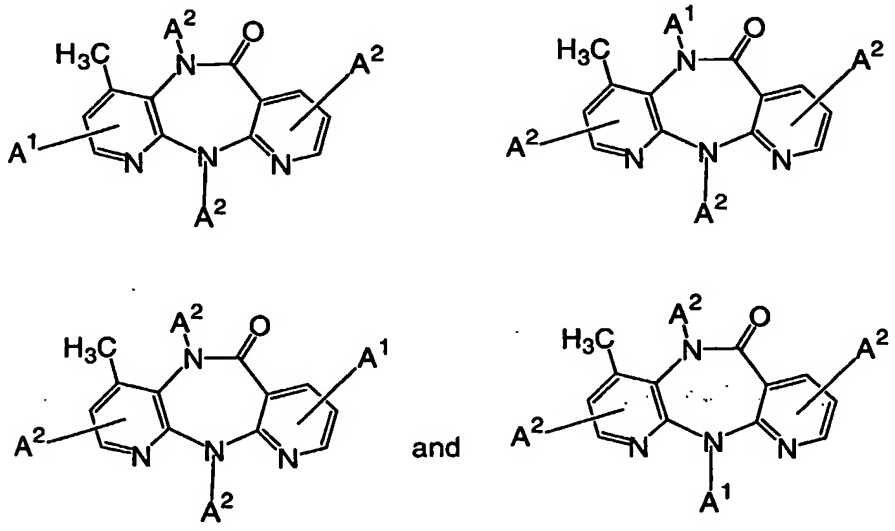
191. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:




and


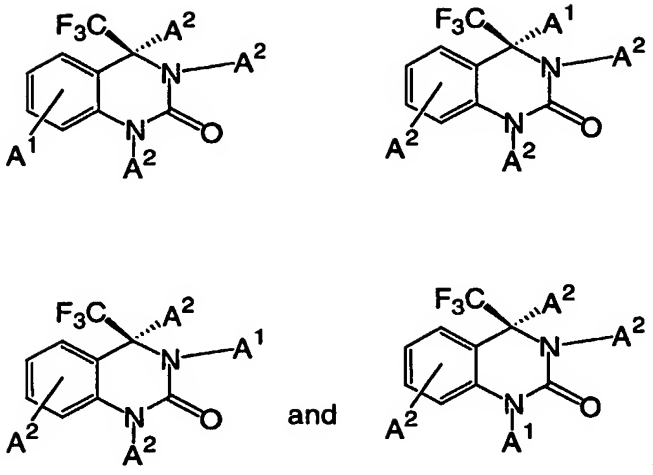
192. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



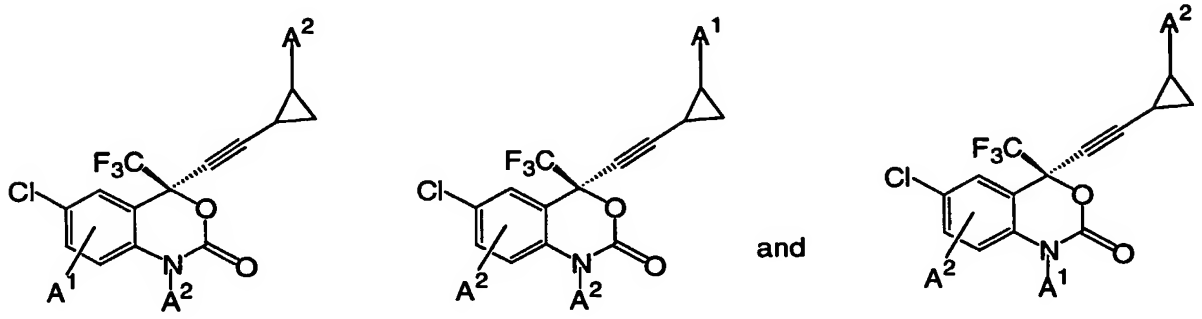
193. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



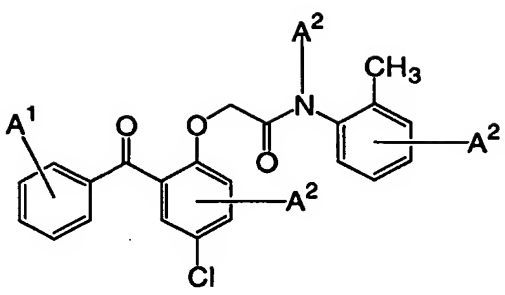
194. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:

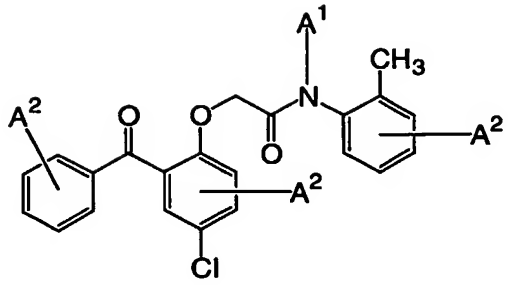


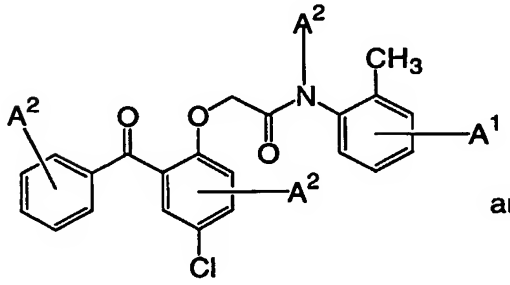
195. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



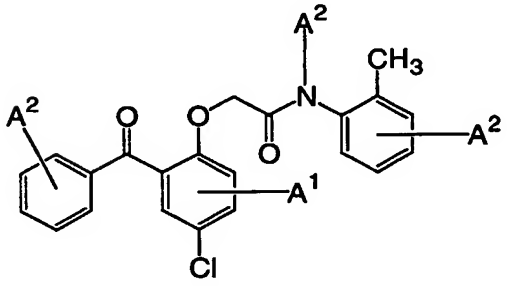
196. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



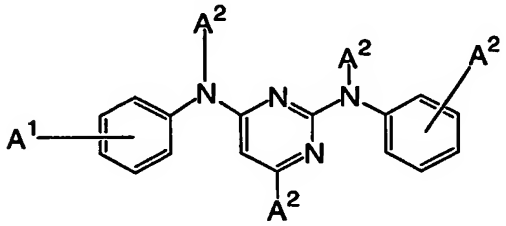


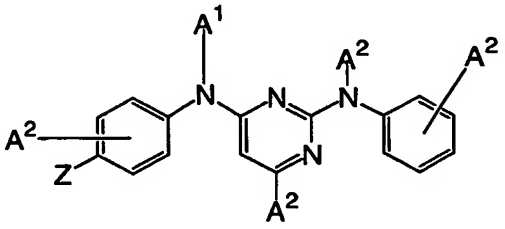


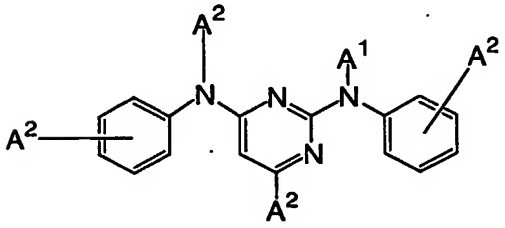
and

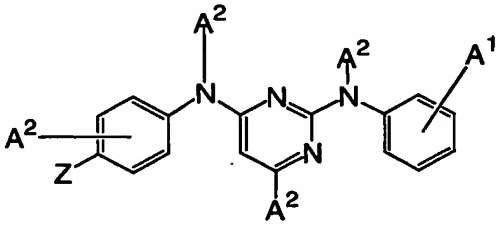


197. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:

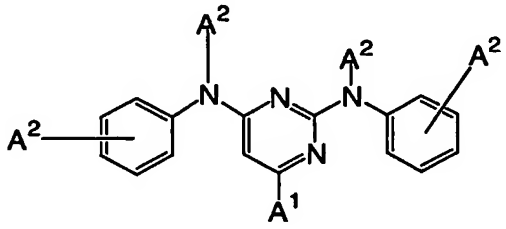






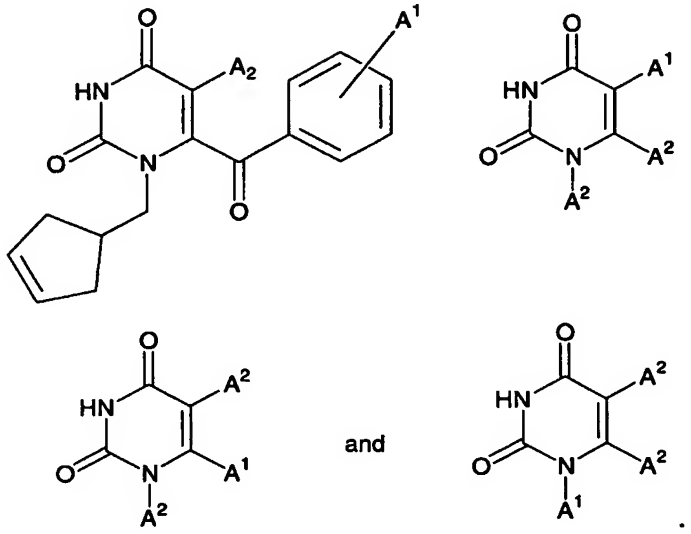


and



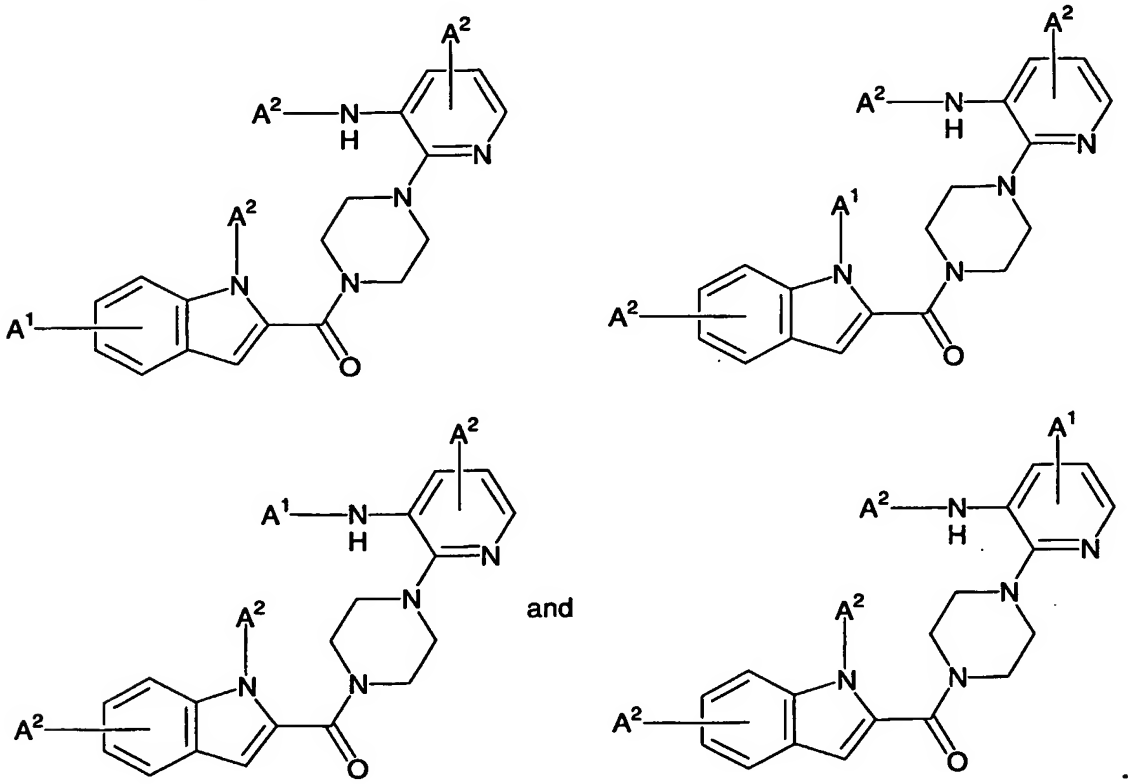
5

198. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



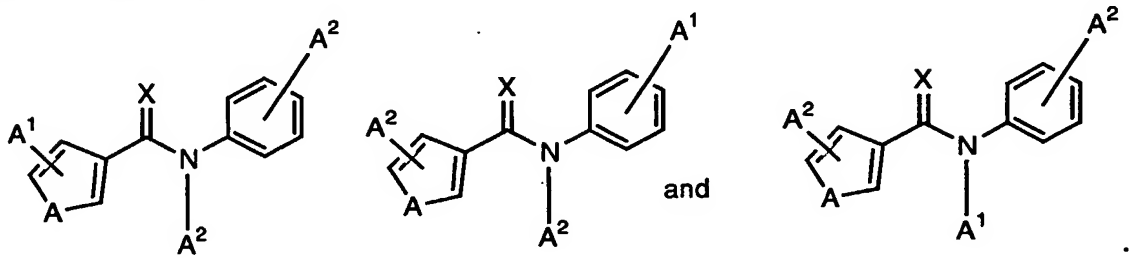
and

199. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



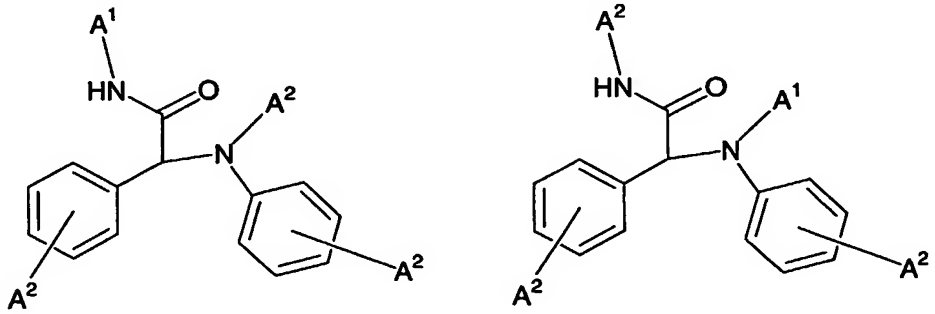
and

200. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:

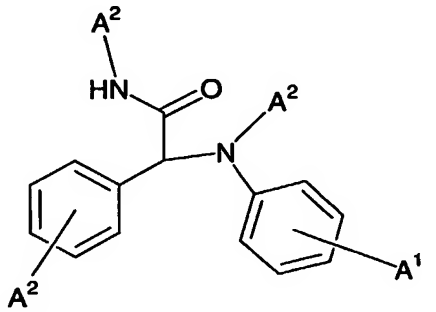


and

201. The improved non-nucleotide reverse transcriptase inhibitor compound of claim 188 of the Formulas:



and



202. An MBF compound of Table 100.

203. A compound described herein.

204. A compound of claim 203 described in the schemes or examples.

205. A method of making a compound described herein.

206. A method of claim 205 described in the schemes or examples.

207. The use of a compound described here for treatment of HIV in humans.

208. The method of claim 207 wherein the compound is described in the schemes or examples.

209. The use of a compound described here in the manufacture of a medicament.

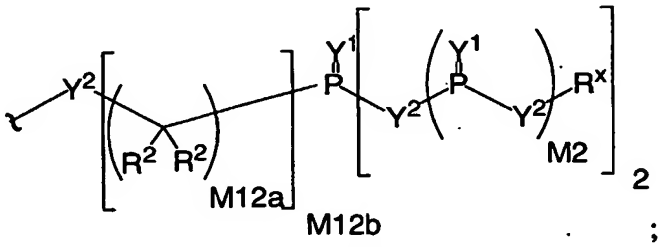
210. The use of claim 209 wherein the compound is described in the schemes or examples.

211. An non-nucleotide reverse transcriptase inhibitor compound capable of accumulating in human PBMCs.

212. The compound of claim 211 further comprising a phosphonate or phosphonate prodrug.

213. The compound of claim 212 wherein the phosphonate or phosphonate prodrug are of the formula $A^3$:

$A^3$ is:

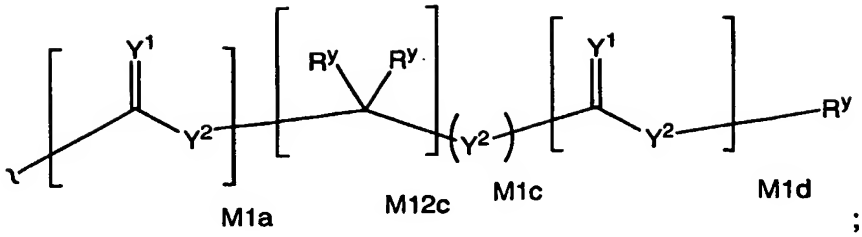



;

$Y^1$ is independently O, S, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, or $N(N(R^x)(R^x))$;

$Y^2$ is independently a bond, O, $N(R^x)$, $N(O)(R^x)$, $N(OR^x)$, $N(O)(OR^x)$, $N(N(R^x)(R^x))$, $-S(O)_{M2}-$, or $-S(O)_{M2}-S(O)_{M2}-$;

$R^x$ is independently H, $R^1$, $W^3$, a protecting group, or the formula:




;

$R^y$ is independently H, $W^3$, $R^2$ or a protecting group;

$R^1$ is independently H or an alkyl of 1 to 18 carbon atoms;

$R^2$ is independently H, $R^1$, $R^3$ or $R^4$ wherein each $R^4$ is independently substituted with 0 to 3 $R^3$ groups;

$R^3$ is $R^{3a}$, $R^{3b}$, $R^{3c}$ or $R^{3d}$, provided that when $R^3$ is bound to a heteroatom, then $R^3$ is $R^{3c}$ or $R^{3d}$;

$R^{3a}$ is F, Cl, Br, I, -CN, $N_3$ or $-NO_2$;

$R^{3b}$ is $Y^1$;

$R^{3c}$ is $-R^x$, $-N(R^x)(R^x)$, $-SR^x$, $-S(O)R^x$, $-S(O)_2R^x$, $-S(O)(OR^x)$, $-S(O)_2(OR^x)$, $-OC(Y^1)R^x$, $-OC(Y^1)OR^x$, $-OC(Y^1)(N(R^x)(R^x))$, $-SC(Y^1)R^x$, $-SC(Y^1)OR^x$, $-SC(Y^1)(N(R^x)(R^x))$, $-N(R^x)C(Y^1)R^x$, $-N(R^x)C(Y^1)OR^x$, or $-N(R^x)C(Y^1)(N(R^x)(R^x))$ ;

$R^{3d}$ is $-C(Y^1)R^x$, $-C(Y^1)OR^x$ or $-C(Y^1)(N(R^x)(R^x))$;

$R^4$ is an alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, or alkynyl of 2 to 18 carbon atoms;

$R^5$ is $R^4$ wherein each $R^4$ is substituted with 0 to 3 $R^3$ groups;

$W^3$ is $W^4$ or $W^5$;

$W^4$ is $R^5$, $-C(Y^1)R^5$, $-C(Y^1)W^5$, $-SO_2R^5$, or $-SO_2W^5$;

$W^5$ is carbocycle or heterocycle wherein $W^5$ is independently substituted with 0 to 3 $R^2$ groups;

M2 is 0, 1 or 2;

M12a is 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12;

M12b is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12;

M1a, M1c, and M1d are independently 0 or 1; and

M12c is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12.

214. The compound of claim 213 wherein the intracellular half-life of the compound or an intracellular metabolite of the compound in human PBMCs is improved when compared to an analog of the compound not having the phosphonate or phosphonate prodrug.

215. The compound of claim 214 wherein the half-life is improved by at least about 50%.

216. The compound of claim 214 wherein the half-life is improved by at least about 100%.

217. The compound of claim 214 wherein the intracellular half-life of a metabolite of the compound in human PBMCs is improved when compared to an analog of the compound not having the phosphonate or phosphonate prodrug.

218. The compound of claim 217 wherein the half-life is improved by at least about 50%.

219. The compound of claim 217 wherein the half-life is improved by at least about 100%.

220. The compound of claim 217 wherein the half-life is improved by greater than 100%.

221. Use of a compound of the invention for the treatment of HIV infection.

222. Use of a compound of the invention in the manufacture of a medicament.

223. Use of a compound of the invention in the manufacture of a medicament for the treatment of disorders affecting white blood cells.

224. Method of treating a disorder affecting white blood cells, comprising:

administering a compound of the invention to a patient in need of white-blood-cell targeting.

225. Method of targeting a compound to white blood cells, comprising:

selecting a compound having a desired pharmaceutical activity and having a first structure;

modifying said first structure by replacing one or more atom of said first structure with an organic substituent comprising a phosphonate group or incipient phosphonate group to provide a compound having a second structure.

226. A method of manufacturing a non-nucleoside compound having both selectivity for white blood cells and a desired pharmaceutical activity, comprising:

chemically synthesizing a first molecule having a first structure containing a phosphonate or precursor phosphonate group, wherein said first structure differs from a second structure of a compound known to have said desired pharmaceutical activity by having at least one hydrogen atom of said second structure replaced by an organic substituent comprising a phosphonate group or incipient phosphonate group.

227. The method of claim 226, wherein said first molecule is synthesized by a series of chemical reactions in which a hydrogen of said second structure is replaced by said organic substituent.

228. The method of claim 226, wherein said first molecule is synthesized by a series of chemical reactions that never includes a molecule of said second structure.

229. Method of accumulating an non-nucleotide reverse transcriptase inhibitor inside a white blood cell, comprising:

administering to a sample a composition comprising a compound of the invention.

230. The method of claim 229 wherein said sample is a patient.

231. The method of claim 229, wherein said compound of the invention has a

chemical structure A-B, wherein (a) a compound having structure A-H has non-nucleotide reverse transcriptase inhibitor activity and (b) substructure B comprises a phosphonate group or a precursor phosphonate group.

232. Method of increasing half-life of a non-nucleoside compound having anti-retroviral activity, comprising:

replacing at least one hydrogen atom or organic radical of said compound by an organic substituent comprising a phosphonate group or incipient phosphonate.

233. Method of designing a drug having specificity for white blood cells for synthesis, comprising:

obtaining a first list of first compounds having a desired activity;

creating a second list of second compounds, each of said second compounds having a structure in which at least one hydrogen atom or organic radical of a compound of said first list has been replaced by an organic substituent comprising a phosphonate group or incipient phosphonate group; and

selecting a synthetic pathway capable of producing some or all of said second compounds from available starting materials, thereby providing a third list of compounds and associated synthetic techniques.

234. Method of manufacturing a pharmaceutical composition having said specificity of claim 233, comprising:

synthesizing a compound selected from said third list using said associated synthetic technique; and

admixing said synthesized compound with a pharmaceutically acceptable carrier.

235. A composition produced by the method of claim 234.

236. Method for producing a pharmaceutical composition having specificity for white blood cells, comprising:

admixing a therapeutically effective amount of a compound of the invention with a pharmaceutically acceptable carrier.